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THE VALUE OF ANTISEPTICS IN THE CONTROL OF BACTERIAL INFECTIONS*

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The question, How far can infections by pathogenic organisms be influenced for the benefit of the host by means of antiseptics? incidentally involves inquiry into the properties of antiseptics which suit them for such purposes, and also into the methods of their application. By "antiseptic" is understood a substance of ascertained chemical constitution harmful to the activities of micro-organisms. The problem, then, is one of chemotherapy in the sense defined by Ehrlich. Restricting consideration to the ordinary bacteria, we shall see that success has been chiefly obtained where the drug can be brought into close contact with the site of a localized infection in a wound or natural cavity. Therefore the chemotherapy of bacterial infections is at present most intimately associated with surgery. Generalized bacterial infections are still practically beyond the reach of antiseptics. This admission must not be interpreted as the confession of failure: the antiseptics now available have very great therapeutic potentialities, and the advances already made open up still wider prospects. It must be remembered, too, that until recently little has been done to correlate biological and chemical work on the problems. In order to clarify the present position the scientific origin of antiseptic treatment will be traced, and the limitations of the older antiseptics will be noted.

Lister and Antiseptic Therapy

Lister was without doubt the first to employ antiseptics on a scientific basis. Fortunately, his guiding principles are authoritatively summarized by the late Sir Hector Cameron in the Dr. James Watson Memorial Lectures (1907), which had been submitted for revision to Lister himself.

"It was hard, perhaps, to appreciate the fact that carbolic acid was not used by Lister (as it undoubtedly had been previously used by others) as 'a local dressing of wounds' with the view of acting directly, and with a specific healing influence, on the wounded tissues, but rather that it was employed to destroy germs which, if they reached the wound in the living state, had the power of preventing the natural processes of repair. . . . His constant aim was to place wounds, as far as possible, in conditions resembling those of subcutaneous injuries, free from the access of external morbid agencies, as well as from direct irritation by foreign substances."

Lister, it is true, applied carbolic acid to the soiled tissues exposed in a compound fracture for the express purpose of destroying pathogenic bacteria which had obtained access to the living body. He must therefore be considered the scientific pioneer in this form of therapy. It should be borne in mind, however, that his attitude was obviously that of one who unwillingly employed an extreme measure to meet a desperate situation. In addition, he was aware of the uncertain efficacy of carbolic acid when used for this purpose, since he observes: "while we endeavour to purify the wound with strong carbolic lotion we cannot be certain of entire success."† The harmful action of carbolic acid on living tissues appears to have been well known to Lister; he did not contemplate its introduction into the abdominal cavity because "it must be in itself a very desirable thing to avoid the direct application to the peritoneum of strong and irritating antiseptic solutions." Further, as Sir Hector Cameron says:

"When dealing with abscess, no antiseptic was ever introduced into the cavity at all. It was far otherwise with many of those who counted themselves amongst his disciples and imitators. Not perhaps thoroughly appreciating the scientific facts which were the basis of the treatment, they were unable to divest themselves of the old idea, that, whatever was used in the treatment of a wound, was necessarily intended to have some specific effect on its healing. It could not, therefore, be brought too freely or too often into contact with it. They filled kettles with carbolic solutions, and poured them over wounded surfaces or injected these same solutions into all interstices of wounds with syringes, while abscesses, empyemata and the like were freely syringed out in the same manner at the time of operation, as well as at every subsequent dressing."

The other antiseptics contemporaneous with carbolic acid—namely, the perchloride and other salts of mercury, boric acid, iodoform, and iodine, etc.—all suffered from the same disadvantage that if employed in concentrations sufficient to damage bacteria their general effects as "protoplasm poisons" on the tissues of the host tended to become prominent. Now it must be remembered that Lister's condemnation of the application of antiseptics to the tissues referred to those substances of which he himself had experience. I am not aware that he ever denied the possibility of finding antiseptics suitable for this purpose.

Need for Therapeutic Antiseptics

The result of Lister's teaching was that operations of election were regularly performed without the supervention of wound infections. This safe conduct into the texture of the body was the prerequisite of the miracles

* Read in opening a discussion in the Section of Pathology, Bacteriology, and Biochemistry at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

† In view of this uncertainty, Lister in such cases came to employ in addition iodoform, which he regarded as probably acting not directly on the bacteria, but by inducing chemical changes in their toxic products as suggested by Behring.

of modern operative surgery. No blessing, however, seems altogether unmixed, and the fact that aseptic wounds can be inflicted at will with so great a measure of confidence has led to undesired consequences which in all probability were entirely unforeseen.

First, the occurrence of infection in a wound of election has now commonly come to be regarded as due solely to some fault in the preparations for, or in the performance of, the operation. In order to realize the error of this generalization one need only recall the "cryptogenetic" infections with pyogenic bacteria in deep tissues altogether apart from any gross trauma. Even gas gangrene sometimes arises at a site remote from the point of entry of the organisms (see Learmonth, 1924). If bacteria can settle, multiply, and set up a focus of disease at a site without any preceding bruise or other gross local pathological condition, it is clear that they are even more likely to behave in this way where the tissues have been damaged by the surgeon's knife. A wound, even when inflicted under the strictest aseptic conditions, constitutes a site of lowered resistance, and is therefore liable to the lodgement of organisms which may reach it from the blood or lymph streams. Consequently, there is certain to be a proportion of septic accidents following operations of election which are due to infection acquired from within, and which cannot be avoided by a technique which aims merely at hindering access of bacteria from that surface whose continuity is breached by the surgeon. Here there is obvious need for a tissue antiseptic. Omission to guard against such endogenous infections must be due to a mistaken interpretation of Lister's teaching.

Again, where the operator is compelled to approach his objective through a naturally infected surface, such as the conjunctiva or a mucous membrane, strong solutions of the old antiseptics cannot be used, unless, of course, a diffuse caustic effect is desired. It is perhaps on this account that the occasional occurrence of meningitis after operative procedures on the nose and related cavities is sometimes viewed as an inevitable accident. Another undesired consequence has been a failure of interest in improving methods of treating wounds which are already infected before coming under the surgeon's care, probably because a feeling of responsibility for such infections has been wanting. The attitude reflected in many surgical textbooks to-day is that in the treatment of infected tissues it matters little what antiseptic is used, since its function is quite subsidiary to that of appropriate surgical manipulation—in other words, excision, drainage, and the natural defensive powers of the tissues will do all that can be expected.

Thus, after the pioneer work of Lister and Koch, therapeutic investigation of antiseptics did not advance rapidly. Behring, Koch, and Stilling pointed out the powerful antiseptic action of certain basic aniline dyes, and Stilling (1891) recommended methyl-violet for treating infections of the conjunctiva and joints. Also extremely potent new organic antiseptics were described by Bechhold and Ehrlich (1906). But these researches attracted little attention.

Stimulated by Ehrlich's fundamental work on the chemotherapy of protozoal diseases, and by observations made by Churchman and Dreyer, Kriegler and Walker on the properties of methyl (gentian) violet, Browning and Gilmour (1913) studied more thoroughly relations between chemical constitution and antiseptic action among the organic dyes, including several of the acridine series. Two of the latter, proflavine (3 : 6 diamino-acridine) and trypaflavine (acriflavine) were put at our disposal by Ehrlich; the last was also examined independently by Shiga for antiseptic action on *V. cholerae*. The need for improving the treatment of war wounds led to renewed activity, and subsequently many substances have come into use; a number of these are a great advance on the older types of antiseptics as therapeutic agents. It is impossible to deal with them all in detail here, but I shall review the experimental evidence of the efficacy of antiseptic treatment and indicate briefly the clinical bearing of the facts.*

Antiseptic Therapy of Recent Infections in Wounds, Serous Cavities, etc.

In order to obtain decisive evidence regarding the curative action of antiseptics it was necessary to make controlled observations on animals. Various organisms and methods of inoculation have been used. As regards imitating pyogenic infections of man, a difficulty is the tendency for the infections in laboratory animals to become quickly generalized.

However, an infection of recent skin wounds in guinea-pigs with a culture of virulent *B. diphtheriae* affords a very suitable test object for therapeutic agents (Feiler). The bacilli do not become generalized, so that in this important respect the condition resembles that usual in human wounds contaminated with pyogenic organisms. At the same time conclusive proof of the effect of treatment is obtained, since in the untreated controls death occurs in forty-eight to seventy-two hours. The following procedure was adopted (Browning and Gulbransen, 1925).

Experimental Technique.—When the animals were under the influence of a general anaesthetic two parallel linear cuts, each about 3/4 inch long and 1/3 inch apart, were made in the shaved skin of the abdomen in the long axis of the body. The strip of skin between the cuts was raised from the deeper structures, and also that for about 2/5 inch on either side of the incisions, so as to form pockets, there being practically no bleeding, and a quarter of a young, well-grown agar culture of virulent *B. diphtheriae* was rubbed into the wounds and the pockets. Periods of 3/4 to two hours were then allowed to elapse before treatment. This consisted in washing out the wounds with 1 c.cm. of a water solution of the substance under test, and swabbing the pockets with a small pledget of cotton-wool which had been soaked for several minutes beforehand in the same solution. The animal was placed on its back during treatment, and the whole procedure lasted for seventy-five seconds. Finally, any fluid not absorbed by the tissues was allowed to drain away and the surrounding skin swabbed dry. There was no further treatment, and all survivors were kept for at least three weeks.

Results.—The outcome of the above experiments was that out of twenty-two inoculated animals treated with acriflavine (1 in 100 to 1 in 2,500) twenty-one survived, whereas of seven treated with carbolic acid (1 in 20 to 1 in 100) five died, and of fourteen whose wounds were washed out with either 0.85 or 5 per cent. salt solution all died. Iodoform in the form of "bipp," rubbed into the infected wounds, failed to save the life of all three animals so treated. Acriflavine is about fifty times more potent than carbolic acid, as measured by the concentrations of the two substances required to bring about cure. Further, it has been shown that the curative effect of acriflavine is not caused by destruction of diphtheria toxin present in the culture used for inoculation, but is due to action on the bacilli (Braun).

Other Investigations.—Virulent streptococci, either in the form of cultures or of material (blood, etc.) from infected animals, have also been used to inoculate recent skin wounds in mice (Reinhardt, Schiemann and Wreschner, Weise, Collier and Bernhagen). In such experiments failure of the therapeutic agent is shown by the animals dying of septicaemia. Here also a single brief application of one of the new antiseptics half to one hour or later after

* Bennett, Blacklock, and Browning (1922) give a critical discussion of earlier clinical observations.

inoculation has preserved the animals from an otherwise fatal infection. It is noteworthy that Weise found excision of the surface of the wound one-quarter to two hours after inoculation to be without beneficial effect. When the inoculation was made into deep wounds of muscles, treatment was less effective than in more superficial wounds. Reinhardt obtained similar results with recent skin wounds in guinea-pigs inoculated with pneumococci and treated by washing of the wounds with the antiseptic half an hour later. The most effective of a series of substances tested was acriflavine; on the other hand, 1 in 20 carbolic acid and tincture of iodine were without perceptible action, but mercuric chloride 1 in 1,000 prolonged the life of the animals. The controls, whose wounds were washed out with saline, died in two to seven days. Infection of the cornea in rabbits, produced by injecting virulent pneumococci, has been sterilized by optoquine instilled into the conjunctival sac or injected subconjunctivally (Ginsberg and Kaufmann). In guinea-pigs inoculated intramuscularly with soil containing pathogenic anaerobes of the gas gangrene group and *B. tetani*, Brunner, Gonzenbach, and Ritter (1918, 1924) showed that the resulting fatal infection could be prevented by antiseptic treatment, even when begun many hours afterwards. All organisms are not equally susceptible in the tissues, however. Thus, Hata (1932) failed to influence recent wound infections with *B. oedematiens*, although this bacillus was not specially resistant to the antiseptic *in vitro*, and the acridine compound which he used was effective against other organisms *in vivo*. The troublesome local septic infections of the skin which tend to occur in scarlet fever patients, owing to contamination with discharges from the nose or ear, have been regularly prevented by treatment of the latter with acriflavine (J. W. Howie, unpublished). It should be noted that in the experiments on wound infections referred to above, the physical conditions were the same in the treated animals and the controls. This is very important, since, as Preobajensky showed, an alteration in the physical conditions of an infected wound may of itself determine the outcome of the infection.

Peritoneal Inoculation.—Where the inoculum is introduced into the peritoneum, from which generalization rapidly occurs, the therapeutic problem is obviously difficult. Nevertheless, very considerable success has been obtained in mice infected with virulent streptococci and treated after an interval, usually one hour, by an intraperitoneal injection of a suitable antiseptic. Untreated controls, or those which received only physiological saline intraperitoneally, died from septicaemia in twenty-four to forty-eight hours. The following results were obtained with the most effective substances tested by Browning, Cohen, Ellingworth, and Gulbransen (1931).

Therapeutic Agent		Cures	Treated	
2 (p-dimethylamino-anil) 6-methylallyl-acetyl amino-quinoline methochloride	(¾ to ½ of tolerated dose used)	34 out of 47	Together 87 cures out of 129 treated	
2 (p-dimethylamino anil) 6-*n*-caproylamino-quinoline methochloride	(¾ to ½ of tolerated dose used)	53 out of 82		
Acriflavine	(¾ to ½ of tolerated dose used)	13 out of 21		

Untreated controls: Of 125 animals inoculated all died in 24 to 48 hours.

Many other substances were without effect, including carbolic acid 1 in 300 (the largest tolerated dose). The general result also of similar experiments by others is that an appropriate antiseptic cures an infection which without it will develop into a fatal septicaemia. The objection may be raised that the interval between inoculation and treatment is short, but in small animals the infection progresses rapidly, so that the period is a considerable fraction of the whole illness.

Treatment of Local Suppurative Processes

Such lesions are not easily produced experimentally in laboratory animals, there being, as a rule, a marked tendency for the infection to spread. Morgenroth and his co-workers tested the effect of the local injection of antiseptic in sterilizing the tissues and preventing the development of a "phlegmon" in mice after subcutaneous inoculation with pyogenic streptococci. But the results tend to be irregular, owing largely to the uncontrollable factor of the individual animal (Browning and Gulbransen, 1928). In experimental empyema in the rabbit, produced by inoculating one pleural sac with streptococci, Gay and Morrison, on injecting acriflavine into one or both pleurae, and in some cases also aspirating the exudate, did not succeed in saving the life of the animals. Although the pleural contents were sometimes nearly sterilized, regrowth and spread of the organisms occurred. Eggerth, employing similarly a mixture of proflavine and sodium oleate with the same object, obtained more promising local results; but here again generalization of the infection vitiated the effects of the treatment.

Observations on treatment of the human subject are seldom adequately controllable, but when in one individual separate lesions, similar in size, severity, and situation, are treated by different methods, differences in the results can justifiably be attributed to the treatment. Graham's (1925) case is convincing in this respect. Three areas on the back of the hand and forearm in which the whole depth of the epithelium had been destroyed by contact with boiling fat, were dressed with acriflavine (1 in 1,000) within an hour after the injury. Two days later granulation tissue was present in the base of all the burns, and there was no suppuration and little discomfort. Then on one of the areas a dressing of wet boric lint was substituted, while the others continued to be treated with acriflavine (1 in 5,000), each dressing being renewed once daily. After six days' application of boric acid the area so treated was actively suppurating and extremely painful, whereas the others were free from sepsis and showed healing in progress. Accordingly, boric acid was replaced by acriflavine, and after three days further this area also was free from pain and suppuration. The results of Turner (1919) in septic and fetid conditions of the gums also have the decisive character of an experiment. In cases where the bad odour was readily detected at several yards' distance from the patient, the breath, twenty-four hours after commencing treatment with acriflavine, was free from smell.

Infections of the urinary tract may be considered here, since local application of the antiseptic can be secured either from beneath by injection, or from above by administering by mouth or intravenously substances which are excreted in the urine. The observations are almost wholly clinical, and, as regards the second method, the substances usually employed are so feeble in their action that doubts regarding their efficacy are not surprising. Infections of the kidney, whether a gross obstruction such as a calculus in the pelvis or ureter be present or not, probably cannot be sterilized by any urinary antiseptic at present available. It is possible, however, in healthy men to procure unfailingly the secretion of urine antiseptic toward both *B. coli* and staphylococcus after the administration of acriflavine combined with alkalinization* (Davis and Sharpe). This fact does not appear, however, to have been much utilized—for example, as a measure preparatory to operation on the urinary tract. The value of antiseptics in the therapy of gonorrhoea at an early stage seems not to be doubted, but much more work is required to discover an ideal treatment.

* A difficulty is the tendency towards nausea and catharsis

The secretion of antiseptic bile is still to be achieved. Intrathecal antiseptic medication in meningitis has not been shown definitely to yield favourable results. It appears so far impossible to influence the bacterial flora of the alimentary tract by antiseptics (Garrod, 1926 ; Graham, 1932 ; Browning, 1933).

General Infections

Koch originally attempted to treat septicaemia by an antiseptic. Mercuric chloride being highly inimical to *B. anthracis*, he injected guinea-pigs repeatedly with it both before and after inoculation with the bacilli. The animals, however, died like the untreated controls, in spite of having received in proportion to their weight an amount of the mercury salt sufficient to prevent all growth of the organisms in a broth culture. Morgenroth and Levy cured experimental pneumococcus septicaemia in mice by optoquine. With this outstanding exception, all attempts to cure a general bacterial infection by such means have failed under experimental conditions, although the bactericidal powers of the blood or serum may be raised temporarily by the injection of certain antiseptics. In experiments already mentioned recent streptococcal infections of the peritoneum were cured by an intraperitoneal injection of antiseptic when organisms were already present in the blood of a control animal. This, however, may merely mean that a certain degree of bacteriaemia does not preclude cure provided that the chief source of infection can be effectively dealt with.

Properties of Therapeutic Antiseptics and their Mode of Action

The new therapeutic antiseptics are mostly dyes. This property is objectionable to many, and doubtless when more is known regarding relations of chemical constitution to antiseptic action colourless substances fitted for the purpose will become available. Further advance depends chiefly on the synthesis of still more suitable compounds. It is important, therefore, to define as far as possible those characters of an antiseptic which indicate its therapeutic value. The essential property, of course, is that the harmful action on bacteria shall exceed that on the tissues.

Effect on Bacteria.—Rapidity of bactericidal action is not essential. Organisms, although continuing to be viable, may nevertheless be profoundly altered in their pathogenic action by contact with the antiseptic, so that the natural defensive mechanisms of the host can come into play effectively. Accordingly, favourable therapeutic results are likely to be due as a rule to co-operation between the drug and the tissues. As an example of this, a concentration of antiseptic sufficient to cure a recent peritoneal infection with streptococci, or to prevent infection when injected as a mixture with the organisms, has been found to take some hours to kill the cocci *in vitro* (Browning, Cohen, Ellingworth, and Gulbransen, 1931).

The following observation illustrates well this problem of reducing virulence (J. W. Howie, unpublished). A strain of streptococci of which a two-thousand-millionth of a cubic centimetre of fluid culture injected intraperitoneally regularly killed a mouse, was treated with acriflavine in gradually increasing concentrations *in vitro* ; finally, although the organisms still grew vigorously, the injection of 1/2 c.cm. of the undiluted culture was harmless.

Again, selective action on one species of bacteria as compared with another may have to be reckoned with, so that the nature of the infecting organism may decide what antiseptic is to be used. However, many of the new antiseptics—for example, acriflavine, proflavine, rivanol, quinanil (Armitage and Gordon), and mercurochrome-220, as well as brilliant-green—all act fairly uniformly on various common pyogenic organisms, although *B. pyocyaneus* tends to be resistant to many. A valuable character of certain of the new antiseptics is that their powerful action on bacteria is not reduced by serum. Substances such as mercury compounds and chlorine derivatives do not merely suffer dilution by serum, but their antibacterial property is enormously weaker in serum than in a watery medium. Among substances not inactivated by serum are acriflavine, proflavine, rivanol, quinanil, and many other analogous compounds prepared by Professor J. B. Cohen and his co-workers. When inactivation by serum occurs frequent renewal of the antiseptic is necessary.

Mutual Effects of Tissues and Antiseptics.—Several effects must be considered. Fixation and consequent inactivation of the antiseptic by tissues and pus occurs to some extent probably with all antiseptics. Graham (1928) measured the absorption of acriflavine, carbolic acid, and mercuric chloride by minced muscle soaked in solutions of these drugs. Mercuric chloride is powerfully fixed, the other two less so ; on the other hand, acriflavine alone of the three is fixed by cotton, and this must be allowed for when applying wet dressings, otherwise one may merely treat the wound with dyed cotton instead of antiseptic solution. It is possible that fixation of the antiseptic by the tissues in an infected area may sometimes be advantageous, since in this way a depot may be created from which continuous action on the organisms will be maintained. Morgenroth attributed the greater therapeutic effect of one substance as compared with another on streptococci in the subcutaneous tissue to such differences in fixation, although both were equally antiseptic *in vitro*.

The liability of tissues to injury from an antiseptic may be measured in various ways. Thus, intravenous injection shows the action on the animal as a whole or on any specially susceptible organ. Unless a substance is intended for intravenous administration, however, this test of toxicity may be too exacting, because a substance like brilliant-green, which is very toxic intravenously, is tolerated safely when applied to the open surface of a wound. Subcutaneous or intramuscular injection also indicates general toxicity provided absorption takes place ; these methods, further, show the local action on tissues. But here again the effect of introducing the substance into the closed tissues may differ from that in an open wound ; for example, brilliant-green solution subcutaneously in the rabbit causes marked persistent local oedema, but when used to dress a wound does not have this effect. Action on delicate surfaces may be ascertained by instilling a solution into the conjunctiva of an animal and retaining it there for some minutes, or by injecting it into the peritoneum.

In all such tests the varying behaviour of different species and even of different individuals must be considered. It is important to avoid irritation of delicate surfaces which harbour bacteria ; thus antiseptics applied in a concentration sufficient to irritate the nasal passages in rabbits led to lighting up of latent pasteurella infection. A number of the new antiseptics are distinguished by the relatively high concentrations required to cause marked irritation or damage of the tissues as compared with the low concentrations which harm bacteria. Tests on cells *in vitro* have been proposed ; the difficulty is to relate them to conditions *in vivo*. Some observers have concluded from such experiments that the tissues are always more vulnerable than the bacteria, and so antiseptic treatment has been condemned by analogy. In actual fact, as has already been seen, infections which would otherwise be certainly fatal can be cured by antiseptic chemotherapy. The method of tissue culture has also been utilized, whereby bacteria and fragments of embryonic tissue are

incubated together for twenty-four hours in a nutrient fluid containing the antiseptic. In this way the concentration of the drug inhibiting proliferation of the fibroblasts and that preventing growth of the bacteria can be ascertained. Of all substances tested, including carbolic acid and mercuric chloride, the only ones which inhibit streptococci in a concentration lower than that damaging to the tissue are acriflavine and other acridine and quinoline compounds (Mueller, Hata). According to Hata, trypaflavine (acriflavine), rivanol, and certain new acridine compounds permit proliferation of the tissue cells in a concentration several times greater than will prevent growth of streptococci. The significance of these results cannot be disregarded, since conditions *in vitro* are much more favourable for the bacteria than for tissue cells. On the other hand, we do not know the relative vulnerability of the fibroblasts of chicken embryos and the mesoblastic elements of adult human and other mammalian tissues. A highly desirable action of an antiseptic would be to penetrate cells without harming them and to inflict damage on organisms in their interior ; probably this does not occur. Failure also to act on bacteria embedded in masses of dead or devitalized tissue was apparently a serious disappointment, which led some surgeons from their experience with severe war wounds to discount the newer antiseptics.

A direct method of investigating action on tissues consists in examining histologically the base and edge of wounds under treatment with the antiseptic, as von Eicken originally did at the early stage. Bennett, Blacklock, and Browning showed that when acriflavine and proflavine are used so as to control sepsis there need be no inhibition of healing. Blacklock, in sections of human material taken during such treatment, found mitoses in various classes of granulation tissue cells and in skin epithelium, as well as active growth of young bone, at depths of 0.018 to 0.2 mm. below the actual free surface. Other properties of antiseptics on tissues may be utilized advantageously—for example, the solvent effect of hypochlorites (eusol) on fibrin and necrotic material.

In the case of fairly resistant tissues, like skin, certain non-irritating antiseptics are available which can be applied in very concentrated form, as for preparation of the skin before operation—for example, mixture of brilliant-green and crystal violet (Bonney and Browning, McLeod and Brown) ; mercurochrome-220 (Young, White, and Swartz) ; hexylresorcinol (Leonard and Feirer) ; and "dettol" (Colebrook and Maxted). Some of these are also used in the vagina.

Summary

1. Several types of compounds are now known which, as compared with the old antiseptics, possess a much higher antibacterial power relative to their toxicity for mammalian tissues. A further advantage of certain of these is that serum does not neutralize their antibacterial action.

2. There is conclusive evidence that by their use recent experimental infections with streptococci and other organisms localized in wounds and serous cavities can be cured, whereas saline washings or injections are without effect. Thus a true chemotherapy of local bacterial infections has been realized. Under similar conditions substances such as carbolic acid or mercuric chloride are much less effective, or fail altogether. Curative action on established local suppuration has also been demonstrated under controlled conditions.

3. Antiseptics intended for therapeutic use must not be considered *en bloc* or selected solely on the basis of their ability to kill rapidly some test organism *in vitro*. Each must be examined as regards selective action on various bacteria in protein as well as watery media *in vitro*, and as regards effects on tissues *in vivo*. Such tests give valuable indications, but the chemotherapeutic efficacy of a substance is finally determined by its influence on the pathogenic action of organisms in an infected host. More extended investigation on these lines is required.

4. The most successful clinical application of antiseptics is likely to be the prevention of infection in tissues liable to contamination, or recently contaminated with bacteria. But limitation of both the extent and duration of established pyogenic infections, and hence of the various consequences, can also be attained. Necrotic or devitalized tissues cannot be sterilized. Accordingly antiseptics must be used as an addition to established physical (operative, etc.) measures and other forms of therapy. Details of procedure cannot be transferred by analogy from one animal species to another, and the surgeon must therefore work out the best methods of utilizing the properties of the new antiseptics in human treatment.

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(References not in the above list will be found in the author's articles in the Medical Research Council's *System of Bacteriology*, vol. i, p. 202 ; vol. ii, pp. 142, 225 ; vol vi, p. 501. See also Braun and Goldschmidt: "Die Methoden der tierexperimentellen Wundinfektionen" in Abderhalden's *Handbuch der biologischen Arbeitsmethoden*, Abt. VIII, T. 2, Berlin and Vienna, 1927.)

According to L. Klein (*Thèse de Paris*, No. 121) some authorities are of the opinion that rice beds have little to do with the spread of malaria. Italian writers, particularly Alessandrini, have even suggested the establishment of rice beds as a prophylactic method against the disease. Although rice beds bring about an extraordinary increase in anopheles, these mosquitos, according to Alessandrini, do not give rise to malaria. On the other hand, the recrudescence of malaria in certain regions where it was very rare before the establishment of rice beds shows that the culture of rice is inadvisable as an antimalarial measure. As, however, rice beds cannot be suppressed without causing serious economic loss to the country, other measures must be taken to prevent the spread of malaria, such as periodical drying of the rice bed for four days every fortnight to destroy the larvae, the introduction of fish for the same purpose, and the prohibition of rice beds in a radius of less than 1,000 metres of a village. Unfortunately, as the natives in the colonies are the slaves of tradition, it is very difficult to make them adopt the smallest modifications as regards the culture of rice, so that the problem of malaria and rice fields is still unsolved.

THE USE OF RADIUM IN CARCINOMA OF THE BLADDER*

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The views held by urologists and radiologists as to the efficacy of radium in the treatment of bladder tumours vary widely—so widely that an investigator coming new to the subject could not but be impressed by the very marked divergence of opinion even among eminent men who have presumably given radium a fair trial. There are those, for instance, who champion radiation methods so enthusiastically that they use neither excision nor fulguration. Barringer of the Memorial Hospital, New York, is one of these, and all bladder tumours at his clinic have been treated by radiation methods, chiefly radium, for the past eighteen years. There are many others who say that its intervention has been productive of harm rather than good. Among these are many urologists in this country, and radium is used very much less here or on the Continent than in the United States.

In other branches of medicine where there is doubt as to the wisest choice between entirely different methods of treatment it is often found that none of the methods involved is very satisfactory, and it will be admitted, I think, that this is the case in carcinoma of the bladder. This remains true, despite the advances in bladder surgery during recent years, the reason being that surgery still fails in a large number of cases, and that the majority of bladder cancers are beyond the reach of surgery when first seen. It seems reasonable to suggest, therefore, that radium may have something to offer in the treatment of carcinoma of the bladder as it has in other sites, such as the cervix uteri, where surgery, at any rate, has its limitations.

Although radium has been used in the treatment of bladder tumours for years, it is comparatively recently that radium treatment could be discussed and analysed on the same sort of criteria as apply to older and established methods such as surgery. It is true that a comparison of radium treatment with excision is not easy for many reasons, but enough cases have been treated over a sufficient period to enable us to assess its value and to form some idea of what contribution it can make to the solution of a problem which is admittedly a difficult one, and in which advance, even in recent years, has been slow.

Features that Favour Treatment

There are some features of bladder cancers that should favour any form of treatment which has a chance of eradicating the disease. One is that local glandular involvement is late, and, indeed, is often absent even in quite inoperable cases. Another is the rarity of early metastases, although these are present in a high percentage of cases in which the patients die of the disease. Approach to the bladder is easy, and excision in many cases is not a difficult matter. On the other hand, patients with carcinoma of the bladder are past middle life, and are often reduced to poor condition as a result of haematuria or cystitis, or both. The majority of cancers arise on or near the trigone, so that excision is impossible without transplantation of one ureter, or total cystectomy. In addition, there is a large group of cases, varying from 45 to 60 per cent. with different surgeons, which are inoperable when first seen. Faced with such difficulties, radium, if it is an adequate method of attack, is in a position of advantage, especially with regard to the situation of many growths. It can be used, for example, in cases where the growth is close to the ureteric orifice without grave risk of subsequent stenosis.

Before proceeding further, it must be stressed that, although comparisons are odious here, as in other things, they are in this sort of discussion necessary. A new form of treatment must be judged on its merits, and these can only be assessed in so far as the method of treatment compares favourably or unfavourably with pre-existing methods. And here a difficulty arises at once. It is said, and the view is held by many, that operable cases should be treated by excision, and that radium should only be used for the rest ; it is undeniably impossible to compare the methods, because each is dealing with a different type of case. It is important to remember in this connexion that large numbers of malignant bladder growths are inoperable when first seen, by reason of their extent, their fixation, the glandular involvement, or metastases. With regard to operable cases, it is, I think, possible to come to certain definite conclusions as to the use of radium, and these two groups of cases will be discussed later.

Early Radium Methods Reviewed

Early attempts at treatment consisted in the introduction into the bladder, per urethram, of catheters containing radium tubes in the distal end, and this was often combined with external radiation from applicators placed over the suprapubic region. This method resulted sometimes in temporary cessation of haemorrhage and control of symptoms. Later, use was made of ingenious fixing devices, whereby high-content radium tubes could be placed in contact with the growth by vision through a cystoscope. This method had the disadvantages that the time factor could not be prolonged, and that the maintenance in position of such apparatus was a difficult and often painful business.

The suprapubic approach and interstitial radiation were next tried, and glass radon seeds inserted into the growth. As was inevitable, extensive and intractable radium burns rewarded this method, although in a few cases, after much tribulation, the disease cleared up.

The insertion of radium needles gave better results, and this method is still used. The needles are inserted into the base of the tumour, so as to form a field of radiation in the bladder wall deep to it. They have walls usually of 0.5 to 0.8 mm. of platinum, and are of low linear intensity—0.5 to 1. The radiation time extends over a number of days, usually five to seven. The confined space and the irregular bases of many bladder tumours often make it difficult to place needles accurately, so that homogeneous radiation is obtained. In addition, the fact that threads are attached to them makes it easy for them to be displaced, and they have to be removed at the end of the required period of irradiation.

Use of Radon Seeds

Screened radon seeds have none of these disadvantages, and after their introduction by Failla they began to be used extensively by the suprapubic route. In the United States the insertion of screened radon seeds by means of the cystoscope was first carried out by Young and Keyes, and in this country by the late Frank Kidd and Ogier Ward. At the present time radon seeds are being used more and more in carcinoma of the bladder. They have many advantages, not least among which is the fact that they can be left permanently in position, and so, when inserted by the suprapubic route, the bladder can be closed. They are easier to manipulate than needles, and can be introduced, if necessary, by means of a curved cannula. They are suitable for use in tumours

* Read in opening a discussion in the Section of Radiology and Electrotherapeutics at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

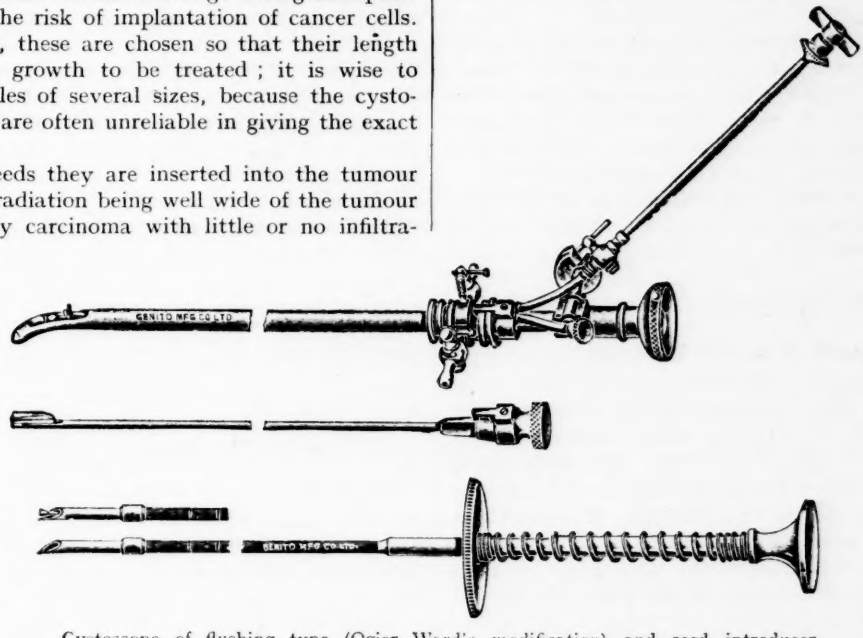
of irregular outline and base, and, on the whole, are more adaptable than needles. For insertion by the cystoscopic route their advantages are obvious.

The filtration and content of seeds vary, but they are commonly either of platinum or of gold, the thickness being from 0.3 to 0.5 mm. The content ranges from 1 to 2.5 mc. each. The length can, of course, be varied at will, but the standard length is 0.6 cm.

The Suprapubic Route

The bladder is opened in the usual way, care being taken to work in a dry field, and to cover the wound edges to avoid implantation. Many surgeons remove a bulky papillary carcinoma with the diathermy before inserting radium ; this avoids haemorrhage during manipulation, and reduces the risk of implantation of cancer cells. If needles are used, these are chosen so that their length is suitable for the growth to be treated ; it is wise to have at hand needles of several sizes, because the cystoscopic appearances are often unreliable in giving the exact size of the lesion.

In the case of seeds they are inserted into the tumour base, the area of irradiation being well wide of the tumour limits. In papillary carcinoma with little or no infiltration, the seeds are inserted in the bladder wall in one plane. Judgement as to how deep it is safe to place the seeds is difficult in infiltrating carcinoma, and only comes by experience. The bladder is either sutured without drainage—and it is claimed for this method that a considerable number of such cases heal without leakage, thus avoiding wound infection—or a drainage tube is inserted.



Cystoscope of flushing type (Ogier Ward's modification) and seed introducer. The cystoscope has a valvular attachment so that escape of fluid is avoided while inserting the introducer.

The Cystoscopic Method

The other method commonly used is the cystoscopic, and consists in the introduction of screened radon seeds through a ureteric cystoscope, which must be of the flushing type. The cystoscope was first used in this country by the late Frank Kidd, and certain modifications have been made by Ogier Ward. After inserting the instrument, the flexible introducer is passed into the bladder, having previously been loaded with a seed. The sharp end of the introducer is then plunged into the required place in the bladder wall, and the seed expressed by means of a spring handle of the thumb-press type. At the Radium Institute the seeds for this purpose are made with especially sharp points to render insertion easy.

A minute description of the technique would be out of place here ; suffice it to say that seeds are introduced as far as possible beneath the tumour, the point of the introducer being inserted through normal bladder just outside the neoplastic area. The procedure is often a a tiresome one, and demands great patience. It is sometimes found that the bladder wall is so tough that it is difficult to make the flexible introducer penetrate the requisite distance. On the other hand, when the instrument has to be inserted into tumour tissue, the latter may prove so friable and soft that the seed drops out as soon as it is introduced.

Bleeding is often a great obstacle to accurate implantation of the total number of seeds. Much of this difficulty can be overcome by the use of the flushing instrument, and in the case of Ogier Ward's introducers, they can be used as electrodes to coagulate the tissue either before or after implantation if the growth bleeds too profusely. If troublesome bleeding occurs and a good view cannot be obtained, it is wiser to insert the remaining seeds at a later date.

At the end of the seeding the base of the bladder should be inspected to make sure that no seeds have dropped out of the growth during the operation. If a seed is found lying on the trigone, it is probably because it has been introduced through a portion of growth, the introducer being, not in the bladder wall beyond the growth, but lying free in the bladder behind it. The delivery of the seed into the wall, however, conveys a distinctive impression to the hand, and this should not happen without the knowledge of the operator.

Radiographs should be taken after forty-eight hours and four days, in order to make sure that all the seeds remain in position, and all urine passed by the patient must, of course, be examined to make sure that seeds are not included. Seeds left lying free in the bladder are passed painlessly at the first urination, as are seeds which drop out subsequently. The patient need not remain in bed more than four to five days, or in hospital more than a week.

Each of these methods, suprapubic and cystoscopic, has advantages. For the suprapubic method it can be claimed that the growth can be inspected more thoroughly and palpated, that biopsy is made easy, and that the introduction of radon seeds is done by direct vision in a good light, and is therefore more accurate. The cystoscopic method has the advantages that the bladder is not opened, that the patient need not be in hospital more than five to seven days, and that in the case of difficulty of introduction or the desirability of splitting the dose, the insertion of the required number of seeds can be done at more than one sitting. The cystoscopic method is not, however, suitable for the treatment of growths in any part of the bladder. Tumours situated in the anterior wall or vault of the bladder cannot be reached satisfactorily, and must be approached by the suprapubic route.

Surgery in Bladder Carcinoma

Before discussing the use of these methods, let us consider for a moment the surgical aspect of the disease. It is generally admitted that operable cases, including those in which transplantation of one ureter is necessary, are in the minority. In a recent series of cases (Macdonald) the inoperable cases amounted to 60 per

cent., and this figure is given by many workers. Total cystectomy is a very severe operation, and although during recent years a few surgeons have improved the technique so that the mortality has been reduced considerably, it is still a procedure limited to very experienced urologists, and is a malignant operation from the patient's point of view. The mortality remains very high, and the subsequent life of the patient is often a miserable one.

The results of surgical procedures—namely, partial cystectomy with transplantation of one ureter if necessary—can only be seen from figures, and these are not easy to interpret and to compare, because of the differing ways in which the authors set them out. The operative mortality has been steadily decreasing, and is now between 10 and 15 per cent.

Macdonald, in a recent series of representative cases, quoted forty-four carcinomata of different types ; operative mortality was 13 per cent., and 31 per cent. were alive for three years or more. Although such figures show that treatment by excision leaves much to be desired, the results are such that any other method has to be very carefully considered before it is substituted. These figures apply to 40 per cent., let us say, of the cases. Of the other 60 per cent. it must be admitted that control by diathermy is all that can be offered them, and that cure is out of the question.

Some Results of Radium Treatment

Leaving out for a moment the 40 per cent. operable cases, what has radium to offer the remaining 60 per cent.? At the Radium Institute, London, we have treated 60 cases of carcinoma of the bladder since 1927. The majority of these have been treated by Ogier Ward, and he was responsible for the cystoscopic technique. I quote them here because they were all considered to be inoperable when first seen, either because of the site, extent, or fixation of the growth, or because of the patient's general condition.

Except in those cases in which the growth had recurred after excision, and in those few which were treated by the suprapubic route, no histological data were available, and diagnosis was made on the cystoscopic findings. This is, of course, an important point, and must be taken into consideration when the results are assessed. It may be that a small percentage of these growths were not malignant, and since papilloma of the bladder is sensitive to radium this factor may be reflected in the results.

Many of the cases are too recent to be of value in this discussion, but thirty-eight of them were treated up to 1931, and I shall only consider these. They are divided into two groups: the papillary and the infiltrating types. Twenty-three were of the papillary type ; of these, twenty were treated by the cystoscopic method with seeds, needling by the suprapubic route being the method in the other three cases. Four cases were recurrent after partial cystectomy, and two of these were controlled for periods of two and a half and three years respectively. Of the total number (twenty-three), ten have remained well, five for five years, two for four years, and three for three years after treatment. Of the fifteen infiltrating carcinomata, ten were treated by the cystoscopic method and five by the suprapubic route. Of these, three are alive and well, one for five years, one for four years, and one for three years after treatment. (Three cases in each group were untraced.) These figures are meagre, but they give some idea of the results that have been obtained in a group of cases, all of which were in a very advanced condition when first seen. Of the cases of papillary carcinoma, 43 per cent. were free from disease for three years and more, while 20 per cent. of the infiltrating cases are alive and well after the same period.

Table Showing Results in Thirty-eight Cases of Carcinoma of the Bladder

Type	Number Treated	Cystoscopic Method	Suprapubic Route	Alive over—		
				3 yrs.	4 yrs.	5 yrs.
Papillary... ...	23	20	3	3	2	5
Infiltrating ...	15	10	5	1	1	1
Total	38	30	8	4	3	6

In the United States, where radium has been used for bladder carcinoma longer than in this country, Keyes, Neill, Young, and Barringer, among others, began to report results as early as 1928. Neill (Baltimore) reported on a series of cases, 168 of all types, treated by radium. Inoperable cases numbered 111, and of these 9.9 per cent. were free from disease for three years or more. The remaining 57 were operable, and of these 35.5 per cent. survived the three-year period without disease. At the Memorial Hospital, New York, all bladder cancers, whether operable or inoperable, have been treated with radium for eighteen years, excision never being used. In 109 cases Barringer reports 43 per cent. three-year cures in papillary carcinoma, and 27 per cent. in infiltrating carcinoma.

Burnam, in 1931, quoted results in 111 cases. In the papillary type 17 per cent. of cures were obtained (of these cases the percentage cure in operable cases was more than twice that in inoperable ones). In the infiltrating type 16 per cent. were cured, and here again the percentage in the operable cases was very much higher. Pfahler, in 1931, reported 19.3 per cent. five-year cures in forty-three inoperable cases of all types by coagulation and radium. Darget, in 1933, reported results in twenty-two cases treated by the insertion of needles by the suprapubic route. Of these, seven were of infiltrating carcinomata, three of which were free from disease eight years, seven years, and four years respectively. The method of treatment is interesting, in that a rubber balloon filled with fluid is placed in the bladder in order to keep the bladder wall away from the radium in the growth. It is claimed that subsequent discomfort is minimized by this procedure, and that post-radiation cystitis is much less. The mortality is low—Barringer claims that in his cases it is 7.2 per cent.—and complications are rare.

The aftermath of treatment may be unpleasant, especially where large doses have been given over a wide area. Radium causes a slough to form, which may take months to separate—very much longer than after fulguration. Phosphatic deposits may be found on the area treated, and slough and deposit sometimes make it difficult to be sure whether there is still growth present or not. From the patient's point of view the prospect is often not a pleasing one, but to say that every patient treated by radium is made miserable for months after his treatment is simply not true. In fact, the after-symptoms vary in severity, from dysuria and frequency of a serious kind to transient discomfort which worries the patient very little. There are many patients who are made worse by radium treatment, chiefly those suffering from infiltrating carcinoma of great extent, where the dosage over a wide field is liable to act on the whole bladder, causing a very severe cystitis ; if these patients have received a dose which is insufficient they are made miserable without the disease being eradicated. Experience will, we hope, lead us to avoid these cases.

The results of radium treatment show that papillary carcinoma is sensitive to radium, and that it is amenable to treatment by radium when it is not too extensive, and

when the growth is confined to the bladder. The infiltrating type, on the other hand, is more radio-resistant, and operable cases of this type should, I think, be treated by resection. Inoperable cases must be carefully considered. If they are extensive within the bladder their extravesical spread probably renders them incurable by any means, and widespread interstitial irradiation runs the danger of making the patient more miserable than he was before. Experience with these sixty cases at the Radium Institute seems to show that cystoscopic implantation of seeds should be limited to those cases of papillary carcinoma where the growth or growths are not more than 2 to 3 cm. in diameter, and that larger growths should be dealt with by the suprapubic route ; that operable infiltrating carcinoma should be resected ; and that great care must be taken in selecting inoperable cases suitable for radium treatment.

ALLERGIC FACTORS IN RHINORRHOEA AND NASAL CATARRH*

BY

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The term "allergic disease" has been introduced into medical literature by American investigators (Cooke and others), to designate a number of conditions which show one common aetiological characteristic—namely, hypersensitiveness to proteins or other substances that are innocuous to normal people. For the most part the patients suffer from acute attacks, while in the interval between two attacks they are in good health. Often, however, especially in the more severe cases, they present symptoms of their illness continuously, and suffer from acute exacerbations.[1]

I do not propose to deal with bronchial asthma, skin conditions, or true hay fever,' since these are already clinical entities, but I shall restrict myself to allergy as seen by the rhinologist in a rather indefinite form, either complicated or uncomplicated by catarrh of bacterial origin. The following headings may be mentioned: hypersensitiveness to (1) drugs ; (2) various pollens ; (3) so-called animal proteins ; (4) foodstuffs ; (5) bacterial products ; (6) colloidal substances of unknown composition, the presence of which in the air is due to climatic influences (miasma).[2]

It is a well-known fact that certain people are hypersensitive to certain drugs, but in one important respect they differ from allergics: the symptoms they exhibit with a small dose of the particular drug are the same symptoms exhibited by normal people with an excessive dose. The true allergic exhibits symptoms which are totally different from any that might occur in persons non-sensitive even on really excessive dosage. I propose to pass over hypersensitiveness to various pollens, to animal proteins, and to foodstuffs, but would like you particularly to bear in mind hypersensitiveness to bacterial products.

It has been thought that there was an anaphylactic element in allergic diseases, but the main arguments against this theory are: (1) Allergic disease is often inherited ; anaphylaxis is not. (2) Allergic symptoms are sometimes shown the first time the person comes in contact with the incriminated substance. (3) Allergy cannot be transmitted passively to animals ; in anaphylaxis this experiment usually succeeds. (4) The symptoms of allergy differ largely from those of anaphylaxis, but show resemblance to those of drug idiosyncrasy.

You are all familiar with the typical case of vasomotor rhinitis or paroxysmal rhinorrhoea associated with violent sneezing attacks, and a pouring of clear watery fluid from the nose to such an extent that patients are compelled to use towels instead of handkerchiefs for relief. But I believe, though in many cases I have no definite proof of the statement, that in a large number of so-called chronic catarrhs there is a very definite allergic factor ; and I am sure that it is concerning the latter type of case that we should attempt to increase our knowledge.

Factors Operating in Vasomotor Rhinitis

The factors generally found in cases of vasomotor rhinitis are: (1) some personal idiosyncrasy ; (2) a sensitive condition of the nasal mucous membrane ; (3) some outside irritation ; and (4) a supposed nervous element. Of these I consider the first all-important, and the last almost negligible.

As regards personal idiosyncrasy, we know that allergics, whether they be hay fever patients, asthmatics, or persons sensitive to animal emanations, on cutaneous testing, do not only react to their own usually specific protein, but also to numerous others, and that their sensitivity to these various proteins may vary from day to day. According to van Leeuwen, all allergics are sensitive to human dandruff, though varying in their reaction to other proteins. With this fact I will deal in greater detail later.

Our reasons for suspecting increased sensitivity of the nasal mucosa are rather empirical. The nasal mucosa either appears normal, pale, velvety, and slightly congested, or there may be whitish patches on it. This condition may apparently be rendered less liable to irritation by either cauterization or ionization. In certain patients this treatment affords either relief or cure, but it should be borne in mind that the sensitivity is often only to some specific irritant in the allergic person.

It is fully granted that the external irritation, acting on the mucous membrane of the allergic, is the trigger which sets off the attack. The nervous element is, in my opinion, the one most open to doubt. With most patients I consider that the discomfort, nuisance, and distress of repeated attacks of severe rhinorrhoea, which come on at least expected and most inopportune moments, are the cause of the patient's neurosis rather than the result.

Some Causes of Simple Vasomotor Rhinitis

Let us now consider simple uncomplicated vasomotor rhinitis, which is a condition with which we are all familiar. I am not going to deal with its pathology or clinical manifestations, but I would like to suggest one or two causes of the condition. StClair Thomson, in the 1916 edition of his book *Diseases of the Nose and Throat*, stated that vasomotor rhinitis was more common in the young male than in the young female. I am sure you will all agree with me that in these days the disease is much more common in the young woman. I think the reason is, not that there are more allergics, or that the young women are more neurotic, but that practically all women do use face-powder. We are all familiar with the white sheen that is seen on the septum and turbinates of the more heavily made-up woman. Many women are particularly susceptible to orris root, and I am told on good authority that orris root is to be found in certain makes of powder. In fact, one patient of mine told me that she could not use a powder in which orris root was known to be present, as it "was death to her." Quite often the changing of the make of powder is a valuable aid to treatment ; it is more than the physician can do to stop its use.

* Read in opening a discussion in the Section of Oto-rhino-laryngology at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

Sensitivity to Staphylococcal Infection

I mentioned at the beginning of this paper that patients could be sensitive to a specific bacterial protein. Many patients suffering from typical vasomotor rhinitis have cracks in the skin about the anterior nares, and these cracks have been looked upon as a necessary adjunct to the disease. We all know that unless these cracks are cleared up there is little hope of alleviating the vasomotor rhinitis, whatever treatment to the nasal mucous membrane may be employed. But we see, in our specialty, many cases of vasomotor rhinitis without any obvious cracks; and we have numerous cases of vestibulitis, a condition that is most certainly of staphylococcal origin, which, after persisting for weeks, months, or even years, have no vasomotor symptoms. (The infection of the cracks is always staphylococcal.)

I would suggest, therefore, that the cracks occasionally seen in the nares of patients suffering from vasomotor rhinitis are not necessarily due to the allergic condition of the nose, but that the patient may have had a very mild and unnoticeable staphylococcal infection of the anterior nares, and, being sensitive to the specific staphylococcus protein, the subsequent vasomotor symptoms were caused by the patient's allergy to that particular protein. At any rate we do know, however far-fetched the idea may seem, that vasomotor rhinitis associated with cracks will not clear up until the latter are cured. I have no definite proof that sensitivity to staphylococcal protein is the cause of many cases of vasomotor rhinitis.

In some cases of rhinitis, or, as the patient expresses it, chronic catarrh, there is evidence that the condition may be due to the patient's sensitivity to the protein of a specific organism. It must be in everybody's experience that in many patients complaining of chronic catarrh there is apparently no abnormality in the nose, sinuses, or nasopharynx. On careful questioning these patients give histories of mild stuffiness of the nose with a slight or negligible watery discharge, while at other times they have symptoms of the typical bacterial cold, with a thick muco-purulent discharge. I believe that these patients are really allergics who are sensitive to the specific proteins of one or other of the bacteria which may cause rhinitis, and that the acute exacerbations of the catarrh are due to the bacterial infection, and the intermittent slight catarrh to the allergic reactions of the patient to the specific bacterial protein.

Again, it is a common fact that in many cases of vasomotor rhinitis, especially of the unilateral type, on careful examination, a latent and unsuspected antral infection is found on the homolateral side, and that on clearing up the infection the vasomotor symptoms subside. In these cases I believe that the running from the nose is a local condition, caused by intermittent leakage of the specific protein from the infected antrum.

Nasal polypi are often found in conjunction with asthma, much less commonly with simple vasomotor rhinitis, and it is known that in asthmatics who have this condition local removal of even small polypi causes a diminution of the symptoms. The polypi have been regarded by certain physicians as part of the allergic swelling of the nasal mucosa, but I believe that, however small, they are evidence of a local ethmoiditis, and that their removal allows the secretion in the cells to be either washed out or blown clear, thus reducing the chance of affection of the sensitive mucous membrane of the nose by that specific bacterial protein.

A patient of mine suffered from very severe asthma, which completely incapacitated her. When I first saw her she had a mild ethmoiditis, which I treated by an anterior middle turbinectomy and curetting of the ethmoid cells. This treatment was followed by a series of minute doses of an autogenous vaccine, with improvement. Small polypi then began forming with recurrence of the asthma, which was temporarily relieved by removal of the small polypi and with continuance of the vaccine therapy. However, in spite of several local removals of the polypi, spread over many months, her asthmatic condition became very much worse. She had, I should have mentioned, an intercurrent antral infection which increased the symptoms, but on opening and washing out the antrum the symptoms improved, and she was back at her old level. This antral infection was purely an intercurrent event in my opinion, but, as I have said, the continuance of the ethmoiditis caused her to be completely incapacitated by her asthma. I therefore decided to perform an external ethmoidectomy, with a view to exenterating all the ethmoid cells. Since then her asthmatic condition has been wonderfully improved. She still has her ups and downs, and has pocketed pus behind the scar or in the nose on occasion, when her symptoms are always more pronounced but are almost immediately alleviated by drainage of the cooped-up secretion. That she has these recrudescences is probably due to faulty technique of my own. She has continued with intermittent courses of autogenous vaccine in minute doses; any large increase in the dose immediately brings on an exacerbation of the asthmatic symptoms and nasal discharge.

I must apologize for quoting a case of asthma as illustrative of some of my points, but it was one of the most severe cases I have had to deal with, and the results, though not dramatic, were satisfactory, and, I think, have a bearing on my point concerning specific bacterial protein sensitivity.

Autogenous Vaccines in the Allergic

Out of the case I have just quoted there emerges another question, that of giving minute doses of vaccine to asthma patients with apparent improvement, whereas the ordinary minimum dose of vaccine given to patients suffering from any form of bacterial rhinitis causes an exacerbation of the symptoms in the allergic. It is known that one can immunize people sensitive to a specific protein by injecting infinitesimal doses of that protein at frequent intervals, say every other day or twice a week, whereas larger doses of the same protein cause increased sensitivity. Ipecacuanha is a case in point.

We know that certain bacteriologists in cases of chronic catarrh are accustomed to give infinitesimal doses of autogenous vaccines over a long period of time, with improvement, the doses being minute in comparison with the ordinary doses of vaccine given, either for treatment or for prophylaxis, in bacterial catarrhs. I would suggest that the results are obtained, not by an immunization of the patient against these organisms, but by the desensitization of an allergic patient to specific protein of the bacteria in his nose. Further, we have all seen patients who complain bitterly of catarrh when in theatres, cinemas, and close warm rooms where people are assembled, whereas they are completely free from it when out of doors, whether in hot, still weather or whether walking over wind-swept moors. One would naturally conclude, I think, that people suffering from a bacterial catarrh would be worse under the conditions of cold and wind. Even the normal person experiences running from, and stuffiness of, the nose under these conditions.

As I have mentioned, van Leeuwen states that all allergics are sensitive to human dandruff. He is also the pioneer of the "miasma theory" of allergic irritation. This theory presumes that allergic patients may be sensitive to foreign proteins in the air, which are in such infinitesimal quantities that their presence cannot be proved. It is not hard to visualize the fact that human dandruff may be present in sufficient quantity in the air of crowded rooms and theatres to satisfy these postulates in the case of allergic people. This may be an explanation of this type of catarrh, for in most cases when the patients arrive in the cool quiet of the consulting room their upper air passages appear normal.

I apologize for being so unscientific and for having stated so many unproven opinions, but I believe that the study of allergy in connexion with our specialty is still in its infancy, and that several aural conditions, which are now tentatively supposed in some cases to be partly allergic, will in the future be definitely established as such. Out of my ignorance of the subject I fear I have been provocative to those who know more. My only hope is that I may have stimulated the more knowledgeable to a good discussion from which some of us may learn something for the future.

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THE ADVANTAGES OF INTRAVENOUS (EVIPAN) ANAESTHESIA IN OPHTHALMIC SURGERY

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Although intravenous anaesthesia with evipan is used on quite a large scale in many hospitals to-day for various types of cases it is perhaps not fully realized that it is of particular value in ophthalmic surgery. This article is designed not to introduce the authors as authorities on evipan anaesthesia, but to set down their experiences with a small series of some eighty-six cases at the Royal Westminster Ophthalmic Hospital and their conclusions therefrom, as we feel certain that our findings may be of interest and of practical value to many persons engaged in ophthalmic practice who may not have used this type of anaesthesia in their operative work.

As only a minority of ophthalmic operations are performed under general anaesthesia our series is necessarily small, but so superior have been our results with evipan in comparison with other forms of general anaesthesia in our operative work at this hospital, both from the ease and speed of induction, the saving of time, the simplicity of apparatus, the optimum conditions for the surgeon, patient, and anaesthetist, and the apparent great margin of safety, that we have adopted evipan as the routine anaesthetic for practically all cases requiring general anaesthesia. In every case in our series evipan gave more or less complete satisfaction to the surgeon, and we have not had any worry, from the anaesthetist's point of view, in any patient. Our observations will be presented under the following headings: technique of injection, dosage, etc. ; general advantages of evipan ; special advantages in ophthalmic surgery ; and an analysis of our series.

Technique of Injection, Dosage, etc.

With a little experience the optimum dosage can be very accurately calculated after a rapid consideration of the length of anaesthesia required, of the patient's approximate body weight and age, and whether of a robust, frail, or toxic constitution. Our dosage varied from 4.5 c.cm.* in the case of old toxic patients to a full 10 c.cm. in strong, healthy adults. In a few of the latter we found it necessary to give as much as 12 c.cm. to produce the requisite degree of relaxation. Healthy children required a relatively much larger dose than adults, a healthy average child of 4 years taking 5 c.cm., while children of 10 years and upwards generally required a full 10 c.cm. Old, feeble persons required very little more than 4 c.cm.

Having roughly estimated the required dosage for the individual case, a 10 c.cm. syringe is fully charged with a previously mixed solution of evipan, and the needle introduced into a vein in the arm, the patient being instructed to count slowly aloud. When consciousness is lost, as indicated by the cessation of counting, the amount already injected is noted and the injection continued until as much again has been given, in accordance with the practice of the German school. The needle is kept in the vein, and the surgeon then grasps the conjunctiva with forceps. If the dosage is insufficient, as indicated by movements of the patient's limbs, a small additional injection is made until the patient relaxes, the anaesthetist being careful not to exceed his original estimated dose by more than 1 to 2 c.cm. unless the movements of the patient indicate a further dosage. After consciousness is lost the jaw is kept supported to keep a clear airway. *No preliminary medication is required or should be given.*

Carbon dioxide and oxygen for inhalation is kept at hand in case of respiratory failure, but we have not found the use of this emergency treatment necessary in any of our cases. In many of the older cases a severe sneezing reflex, several times repeated, occurs during early manipulations of the conjunctiva. This does not, however, seriously interfere with the course of the operation. A delay of one or two minutes before commencing the operation frequently eliminates this phenomenon. It has not occurred in any of the children in the series. With children, the arm must be kept rigid during the injection, as otherwise the needle may be dislodged by a sudden movement as the patient loses consciousness.

In the average case under the above technique the duration of anaesthesia suitable for ophthalmic surgery is from fifteen to twenty-five minutes. In very short operations a reduced dosage is given, and when more prolonged anaesthesia is required a further injection may be given when the effects of the original dose show signs of wearing off. This appears to act very satisfactorily. Our longest case was on the operating table for one hour and fifteen minutes, during which time a total of 14.5 c.cm. was given in two separate injections, the anaesthesia being satisfactory throughout.

General Advantages of Evipan

Evipan may be given with safety to patients of any age, provided a very small palpable vein can be found. We had no difficulty in this respect even in very young children. The youngest patient in our series was 4 years of age and the oldest 85.

The contraindications are very few—mainly severe disease of the liver and of the kidneys—and it appears to be safe to use the method even in severe diseases of the cardiovascular and respiratory systems, where inhalation anaesthesia may involve grave risks. The induction is very rapid. The material is inexpensive, requires an absolute minimum of apparatus, and does not need any special skill on the part of the anaesthetist. The period of recovery is very rapid, several of our cases being able to talk rationally within fifteen minutes of leaving the operating table. In the majority of our cases there were practically no after-effects attributable to the anaesthetic. The adult patients were in all cases very pleased with the anaesthesia.

In this connexion it is interesting to note that one of the authors had an evipan injection for the removal of some teeth, having previously at one time or another taken most

* Strength of solution is 1 gram of sodium evipan per 10 c.cm. of distilled water.

inhalation anaesthetics. He considers evipan far superior to anything he has previously experienced.

In the stress of circumstances it is possible for a surgeon to give the anaesthetic and carry on the operation with a minimum of nursing assistance and practically no danger to the patient. Evipan may be given without danger with a partially full stomach. Owing to the great rapidity of induction, the total time required for an operation is very materially reduced, especially with several consecutive short operations.

Special Advantages in Ophthalmic Surgery

The whole of the face and head is left free for the surgeon, which is a considerable help in eye operations. As most ophthalmic operations are of short duration, a single evipan injection is peculiarly suitable to most such. We have found it very suitable for cases of squint in children, for excisions and eviscerations of the eyeball, for acute glaucoma, plastic operations—in short, for practically all eye operations *where a general anaesthetic is advisable*.

Under evipan anaesthesia the intraocular tension falls, both in eyes with normal tension and in those with raised tension. This was demonstrated in selected cases in our series by palpation and by the use of the Schiotz tonometer. This is a very advantageous factor in operations for acute glaucomatous conditions. In a considerable number of ophthalmic operations the subjects are old, enfeebled persons, perhaps suffering from diabetes, tuberculosis, or other constitutional diseases, in whom inhalation anaesthesia frequently involves grave risks. In the majority of these cases evipan may be given with safety, with every satisfaction to the patient and surgeon alike.

Analysis of Our Series, with Comments

1. *Excision of Eyeball.*—Evipan is ideal for this operation, and we have now adopted it as the routine method of anaesthesia. Thirty-nine operations were done, the age of the patients varying from 30 to 85 years. Particular mention should be made of the advantages over inhalation or local anaesthesia in the following cases:

(*a*) I. B., male, aged 58 years, an advanced case of Graves's disease with chronic iridocyclitis from corneal ulceration, due to severe proptosis.

(*b*) A. S., male, aged 66 years, severe arteriosclerotic and hyperpietic, with recent hemiplegia and mental changes.

(*c*) W. J., male, aged 72 years, very feeble patient with myocardial degeneration and chronic bronchitis.

In all these cases anaesthesia was most satisfactory, and there were no untoward after-effects. Another patient, M. P., male, aged 65 years, was feeble and cachectic, and clinically his liver contained large masses of secondary growth. He was given evipan for removal of a secondary glaucomatous and painful eye, the seat of a primary malignant melanotic tumour. No ill effect followed, although it is said that severe liver disease is a contraindication to the use of evipan.

2. *Evisceration of Eyeball.*—Nine cases, age of patients varying from 9 to 75 years.

3. *Operations for Glaucoma.*—Six cases, consisting of four trephines, one Lagrange's operation, and one posterior sclerotomy. The only difficulty here, as in any general anaesthetic, is the tendency of the eyeball to roll upwards, although this tendency is much less noticeable with evipan than with inhalation anaesthesia. We have found that the intraocular tension is always lowered; this is easily demonstrable by palpation, and we have shown it conclusively by the Schiotz tonometer to be reduced by as much as 10 mm. in some cases.

4. *Lid Operations and Plastic Operations on Sockets.*—Eight cases. The great advantage here is that distortion of the eyelids with local injection fluid is avoided. One case, J. W., male, aged 66 years, underwent a successful operation for paralytic ectropion (due to facial palsy complicating middle-ear disease), fascia lata strips being taken from the thigh and used as slings. The operation lasted one and a quarter hours, and anaesthesia was satisfactory throughout, the total amount injected being 14.5 c.cm. (given in two successive injections). Another case worthy of mention was H. S., male, aged 43 years, suffering from fibroid phthisis, who underwent a "plastic operation on socket" with good result.

5. *Squint.*—Twenty cases, consisting of eighteen "tenotomies and advancements" and two tenotomies. In one case, a nervous female aged 18 years, operation was commenced under local anaesthesia, but the patient was unable to keep still, and so an injection of evipan was given immediately, and the operation proceeded with satisfactorily. Inhalation anaesthesia would have been impossible owing to the fact that the patient had recently had a meal. Evipan has not been used very considerably for squint, because for obvious reasons local anaesthesia is to be preferred when the patient is sufficiently old to exercise self-control.

6. *Attempt to Remove Deep Intraocular Foreign Body.*—One case; satisfactory anaesthesia.

7. *Opening of Lachrymal Abscess.*—Three cases.

Summary

1. The advantages of intravenous anaesthesia with evipan in ophthalmic surgery are shown.

2. A series of eighty-six cases is presented, showing very satisfactory results with no complications.

We are indebted to the members of the honorary staff of the Royal Westminster Ophthalmic Hospital for their kind co-operation in the use of evipan for their cases.

CHORIONIC CARCINOMA

WITH A REPORT OF A CASE FOLLOWING RUPTURED TUBAL GESTATION

BY

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Cases of chorionic carcinoma are always of sufficient interest and rarity to merit publication. According to DeLee[1] "hydatidiform mole preceded the development of this disease in 33 to 40 per cent. of reported cases." Again, Eden and Lockyer[2] state that "in two out of every three cases the immediately preceding pregnancy terminated in abortion." Both the above statements presumably refer to uterine pregnancies. The urgent symptom would therefore be uterine haemorrhage, and the fact that it was preceded by an abortion, either of the ordinary type or more especially of a hydatid mole, would tend to put one on guard. Chorion, wherever situated, may, however, be liable to malignant degeneration. DeLee[1] states that "ectopic gestation may undergo this [hydatidiform] degeneration." Tubal and ovarian pregnancies must therefore share in the general danger.

Chorionic Carcinoma of Tube or Ovary

The clinical picture of a malignant degeneration of a chorion situated in the ovary or tube is nevertheless very different from that of the uterine variety. Such cases must be very rare indeed, and, occurring as they do without the usual symptoms of the uterine type, coupled with the fact that the growth is hidden away in the abdominal cavity, must give rise to much confusion in diagnosis. There is not always uterine bleeding to warn the patient that something is wrong. Advice would tend to be sought late, thus giving further time for the condition to develop. Pain in the abdomen or the presence of a tumour in the lower abdomen following an operation for ectopic pregnancy would be the probable reason for seeking advice.

The literature yields the following information. Risel[3] collected eleven cases of primary chorio-epithelioma of the tube, and reports a case of chorio-epithelioma developing in the pelvis, proved at subsequent operation two

and a half months after removal of tubal gestation (about six and a half months after this had started). The woman died shortly after the second operation, and a post-mortem examination showed no growth in uterus or genitalia, but metastases in liver and lungs. Liepmann[4] reported seven more. In one case recorded by Davidsohn[5] chorio-epithelioma formed in the stump of a tube excised for ruptured tubal gestation. Lefquist[6] gives an account of a tubal pregnancy removed from a tube which was left *in situ*. Two years later a pregnancy recurred in the same tube, which was removed. Pathological examination revealed an early primary chorio-epithelioma of the tube. Hartz[7] described a case of ruptured tubal gestation in which there were extension of chorionic epithelium into the wall of the tube and chorionic epithelial cells in the lumina of some of the veins. The patient was well two years afterwards. In his paper Hartz states that "primary chorio-epithelioma of the Fallopian tube is of comparatively frequent occurrence when we take into consideration that tubal gestation forms but a small proportion of all uterine pregnancies. Of 300 chorio-epitheliomas up to 1905 the primary tubal variety comprised 3.5 per cent." He also states that "metastatic growths occur from tubal growths just as readily as they do from the uterine variety."

Vaginal Metastasis

Duggan,[8] in the report of his case, says that the patient came for treatment of "a rather friable, purplish swelling on the right vaginal wall. A mass was felt in the left vault, not movable, irregular, and slightly tender. Uterus slightly enlarged." Removal of both ovaries and tubes and supravaginal hysterectomy were carried out. The left tube was ruptured. Pathological examination showed chorionic carcinoma. *X*-ray and radium treatment were given, and when the patient was seen two years later "pelvic examination revealed no sign of recurrence—she had gained weight and strength." Bethel Solomons and Smith[9] recorded a case almost identical with Duggan's, and both are very interesting in that a vaginal metastasis was present at the time advice was first sought. Solomons and Smith seem to have been in doubt as to whether their case was secondary to tubal gestation, as "the chance of it being secondary to tubal pregnancy is most doubtful, for her periods had always been absolutely regular." But the history they give surely does not agree with this, for they state "she was sent to hospital because of continuous haemorrhage since her last menstruation, which had started three weeks before admission." Obviously her last period was most irregular. And, equally obvious, before admission she could have had a tubal pregnancy of nearly six weeks' duration which ruptured three weeks before the patient was seen by them. Chorionic carcinoma may have developed at any time within these limits. It is even possible that the previous (?) normal menstrual period was really uterine bleeding associated with a small unnoticed attack of pain due to commencing rupture of the tube.

Miles Phillips[10] had a case of ruptured left tube, with "a small nodule of adherent blood clot on the bladder wall." Tube and nodule were excised. After chorionic carcinoma had been demonstrated microscopically the uterus was curetted, nothing abnormal being found. Six weeks later there was recurrence in the left broad ligament, "an ovoid purplish nodule in the anterior vaginal wall," and a nodule on the bladder wall at the site of the previous nodule. There was also a mass at the root of the mesentery of the small intestine. Total hysterectomy with removal of broad ligament growth, all appendages, and the bladder nodule was then done. The mesenteric growth was irremovable. All these showed chorionic carcinoma. Three years later she was alive with no signs of recurrence in the abdomen or elsewhere. Fleurent,[11] in his case report, quotes Risel's twelve cases, and says that accounts of twenty others were given between 1905 and 1930. If we add his case, Duggan's, Stein's, and mine, the number up to date would appear to be at least thirty-six.

Pathology

It is interesting to recall that Marchand divided the disease into two groups—atypical or benign, and typical or malignant. The benign is characterized by comparative or complete absence of Langhans's cells, and to this type Ewing gives the name "syncytioma." Lynch and Maxwell[12] state "the prognosis in syncytioma is essentially favourable, since the process advances slowly, and the life of the wandering cells is short." Referring to the malignant type, they say "the tumour seems to have a more rapid course, and to metastasize more quickly than does chorio-epithelioma of the uterus. Albert's case and that of Hartz are the only ones which recovered." Duggan's and Phillips's cases are apparently two more.

The degree of malignancy seems to depend on the presence of proliferating and atypical cells of Langhans's layer, which are always present in the malignant type, even in the metastases. Secondaries may be found in the abdomen, spleen, lungs (very common), liver, vertebral column, vagina, and brain. Ovarian changes associated with the disease are well known. Lynch and Maxwell[12] say "there is no doubt but that pronounced cystic changes in both ovaries occur so frequently with chorio-epithelioma as to constitute a specific anatomical feature of the disease." In this connexion, Friedlander[13] quotes Zondek and Aschheim, and Evans and Smith, as showing this formation of lutein material to take place after implantation of anterior pituitary and ovarian substance in animals, and Murati and Adachi as having produced the same results with the placenta. Urine from a case of chorionic carcinoma may contain as much as 500,000 mice units of anterior pituitary hormone per litre, compared with 8,000 to 12,000 units in normal pregnant urine. Does this excess of hormone hold the secret of both chorionic carcinoma and lutein cyst formation?

Friedlander also quotes Oskar Fraenkl as showing that the serum of a normal pregnant woman is able to destroy foetal tissue from placenta, liver, or kidney, while the serum of a woman suffering from chorio-epithelioma does not possess this lytic action. He concluded that the formation of chorio-epithelioma is due to the absence from the blood of the pregnant woman of the syncytiolytic properties of the serum, and believes that spontaneous cures are due to a recovery of these properties. We do not know what limits the normal invasive power of the chorionic epithelium. That there must be some limiting agent is obvious. If Fraenkl's theory holds the explanation, it could be proved by the injection of serum from a normal healthy pregnant woman into a series of cases of chorionic carcinoma. Such a serum would be very easily secured. Theoretically, it should be obtained from women three to four months pregnant, when limitation of the invasive power of the chorionic epithelium should be taking place and the syncytiolytic properties of the serum presumably be at their height. As a control, estimation of the urine as regards the number of mice units (Aschheim-Zondek) of anterior pituitary hormone might be made, and only that serum the urine of whose donor contained less than 12,000 units be used for the purposes of treatment.

History of Case

The following is the history of my case of ruptured tubal pregnancy which was followed by chorionic carcinoma.

The patient, a Hindu, was admitted into the Irwin Hospital, Jamnagar, suffering from pain in the abdomen, with slight, dark-coloured haemorrhage from the uterus. She had missed two periods. Examination revealed a small tender mass in the region of the right tube, and a diagnosis of ruptured ectopic gestation was made. I operated upon her the same day, and found a tubal gestation which had ruptured intraperitoneally. There was not a great quantity of free blood, and not many clots. The tube was removed, the clots were cleared out, and the abdomen was sponged dry and then closed. Her immediate convalescence was uneventful, and she left the hospital three weeks later.

Two months afterwards she was again admitted. She was now looking very ill, and complained of a swelling in the right side, with considerable pain in the lower abdomen. There was no haemorrhage or discharge from the uterus. Palpation confirmed the presence of the tumour in the right pelvic region, and vaginal examination showed that the tumour was in very close proximity to the uterus, which was enlarged to the size of a three-months pregnancy. The upper surface of the tumour reached well above the brim of the pelvis. The woman had lost weight appreciably, and was looking anaemic and obviously worried. I opened the abdomen again, and found the whole of the right side of the uterus and the right broad ligament covered with a soft, friable, dark-grey-coloured growth. Its nature was only too obvious. It had already begun to spread towards the bladder, and there were several small masses on the peritoneum of Douglas's pouch. The right cornu of the uterus was the seat of a somewhat larger mass, and a small piece was taken from this situation for microscopical examination. There was no possibility of benefit from excision of the uterus, as this would have only taken away about a quarter of the growth. The bladder and Douglas's pouch were already involved. The site of the ectopic was a mass of growth. The abdomen was closed on the tragic sequel to what had been a successful operation for ruptured ectopic gestation. The small piece which had been removed was sent to the Haffkine Institute, Bombay, and a report was received ten days later, confirming that the growth was chorionic carcinoma. The slide which the director of the institute sent me was typical of chorionic carcinoma of the uterus.

At this time it struck me that a few doses of deep *x* rays might do the patient some good. They could, at any rate, do no harm, and there was no other possible method of treatment. She was therefore sent to the *x*-ray department, where she received two "massive" doses at intervals of three weeks. I left India about a fortnight after the second dose, so am unfortunately not able to give any later information than up to this date. At this time, however, the tumour had definitely begun to retrogress, and was about half the size it was on admission. The patient's general condition was also much better, and her pain was decidedly less. Locally, therefore, deep *x*-ray therapy had certainly had some beneficial effect. There was always the possibility of metastasis having already taken place, but clinically there had been no signs of this. I do not know whether deep *x*-ray therapy was continued after I left Jamnagar. In view of the benefit already experienced it is to be hoped it was.

Summary and Discussion

Though the story must remain unfinished the following conclusions can be drawn:

1. Ruptured tubal pregnancy, removed by operation, was followed within a very short time by malignant disease of the chorion.

2. Three months after operation the growth had become palpable above the pelvic brim, and was found at the second operation to have involved the whole of the right broad ligament, the right pole of the uterus, the bladder, and Douglas's pouch.

3. The symptoms were: lower abdominal pain, cachexia, and a tumour in the right iliac fossa. There was no uterine bleeding or discharge.

4. Two "massive" doses of deep *x*-ray therapy resulted in definite retrogression of the tumour, considerable lessening of pain, and improvement in the general condition of the patient.

To my mind there are three possible ways in which this case can be explained. In considering them we must remember that we are dealing with a gestation sac which had ruptured into the peritoneal cavity. The possibilities are as follows:

1. During the rupture chorionic elements may have been "sprayed" over the surrounding parts, especially the right broad ligament and the pouch of Douglas. These underwent malignant degeneration later.

2. Chorionic carcinoma may have begun to develop before the actual rupture took place, with the result that malignant cells were directly spread over the broad ligament and Douglas's pouch.

3. This type of growth extends via the veins. Although scattering of malignant cells may not have taken place, the veins of the broad ligament may nevertheless have been packed with syncytial and Langhans's cells spreading in all directions. These would have gone on proliferating after removal of the ruptured ectopic gestation. An earlier stage of this condition would appear to have been present in Hartz's case.

Lastly, the interesting question arises as to the "receptive," or perhaps I should say "resistive," qualities of the pelvic peritoneum in a condition of this sort. We know that the pelvic peritoneum is far more resistant to infection than that of the upper abdomen. But the pelvic peritoneum during the period of pregnancy is not in quite the same condition as it is in the non-pregnant state. There is a much increased blood supply, and all the pelvic organs are in a much more "luscious" condition. May it not, therefore, on this account provide a more "receptive" nidus for the malignant cells showered over it?

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According to S. J. J. Leroux (*Thèse de Paris*, 1934, No. 307) undulant fever is not uncommon in Paris, but often escapes recognition. It is usually contracted by slaughterers and butchers who come in contact with sheep from the Mediterranean district. The other chief sources of contamination are raw goat's milk and cheese. Undulant fever in Paris does not assume any special clinical form, but complications are rare and the prospect of recovery is excellent. As regards treatment, novarsenol, vaccine treatment, and microbial extracts in the form of melitin, endoprotein, or endoglobulin prepared from *Br. abortus* should be employed. Prophylaxis should be carried out by vaccination in infected areas, boiling the milk, and the creation of co-operative stores for the sale of milk and cheese with a sanitary guarantee. The thesis contains the histories of twenty cases in patients aged from 10 to 49.

A CASE OF EPIDURAL SPINAL ABSCESS

BY

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Further to the article on acute epidural abscess by Leonard Abrahamson, A. A. McConnell, and G. R. Wilson (*Journal*, June 23rd, p. 1114), I present below the record of a recent case of acute osteomyelitis of spine with epidural abscess. These cases are fairly rare, and very few are published in the British literature.

Case Record

History.—Mrs. B., aged 38, complained of pain in the middle of the back on November 19th, 1932. The pain increased in severity during the following day. On the first day of the illness she had a temperature of 100° F., becoming normal on the third day. Pain in the back continued. On the third day of her illness she started vomiting, which continued for three days. She also complained of very severe bitemporal headache. She was admitted to the National Hospital, Queen Square, under Dr. Gordon Holmes, on November 28th. Her past history was good, but there had been a boil on her chin three weeks before admission.

Examination.—Speech and all cerebral functions were normal, as were all cranial nerves. There was slight but definite pallor of the left optic disk; the right appeared normal. No diplopia, ptosis, strabismus, or exophthalmos. The motor system was normal as regards the upper limbs and trunk, but the patient appeared unable to sit upright without the use of the arms. Motor power was quite good on both sides in the lower limbs. There was disinclination to exercise full motor power in either limb. Reflexes: biceps-jerk, triceps-jerk, and supinator-jerk present right and left. Upper and lower abdominal reflexes absent. Knee- and ankle-jerks present. Plantar extensor on both sides. No signs of meningeal irritation. Sensation appeared to be normal when tested on admission. Vibration, which was faintly appreciated in both lower limbs, was perhaps slightly more obvious on the right side; it was only faintly appreciated below the tenth dorsal spine.

Progress.—On November 29th the condition of spastic paraplegia, which was present on the previous day, had changed into a marked partial paraplegia of a flaccid type, but with preservation of deep reflexes, which were not accentuated. The right plantar was now extensor and the left flexor. Abdominal reflexes had now disappeared. The intercostal muscles below the ninth on the left side were not contracting, and there was present a relatively sensitive level for pinprick and for vibration at the ninth dorsal nerve segment. Some sensation to pinprick was preserved in the legs. The abdominal muscles did not contract so forcibly below the umbilicus, and the latter was drawn up 2 cm. upon head-raising. This had increased since the previous night. There was tenderness over the lower thoracic and upper lumbar spines. At a later hour of the same day the patient had a complete paraplegia of the flaccid type, with absence of knee- and ankle-jerks. Plantar reflexes were also absent. Sensory examination showed a relatively sensitive level to light touch at the ninth dorsal nerve segment on the left, 2 in. above the umbilicus, and in the ninth dorsal segment 1 cm. below the umbilicus on the right. There was now an absolute level for sensation to pinprick at the proximal portion of the second lumbar segment, below which pain was not felt on either side, except down a strip in the antero-lateral portion of the left thigh, in which the pain from the prick was referred to the foot, beneath the left great toe. There was an absolute level at the third lumbar segment for sensation to hot and cold, that for the former being 2 in. higher than that for the latter. Sensation for deep pressure was preserved in the left toe, calf, and thigh, and in the right leg at and above the knee only. In each case it seemed more distinct in the left leg. Sense of position was present for coarse movements at the ankle, but was absent in the great toes. Pathological examination: differential blood cell count showed 19,000 leucocytes on November 29th at 2.30 p.m. Cerebro-spinal fluid: yellow, setting solid; jelly-like coagulum; total protein 4 per cent., cells 3 per c.mm. On culture, no growth in twenty-four hours.

Operation.—On November 29th, at 11.45 p.m., Mr. Julian Taylor removed the laminae from the seventh to twelfth dorsal. Yellow creamy pus coated the dura over this region. The pus seemed to trickle round from the ventral and lateral aspects, and more was collected towards the caudal portions of the exposure. The next day, at 10 a.m., there was feeble movement of the toes of the right foot. The knee-jerks were absent, and the left ankle-jerk was present: plantar reflexors ? flexor. There was some degree of appreciation of pinprick over both legs. On December 3rd there was a fair degree of appreciation to pain over the left leg and thigh; there was a slight return of sensation to pinprick in the right leg above the knee. Below the knee the prick was felt only as indefinite touch localized to the right leg. Light touch was not felt in either leg. The patient knew when the left, and perhaps the right, foot was being moved. Otherwise sense of position was entirely absent. Sensation to deep touch was present in both legs, and localized to the proper leg. This was preserved before operation. Reflexes in the legs were absent except for one plantar reflex flicker on the left. A radiogram of the dorsal spine before operation showed no evidence of bone disease. It may be noted that the temperature never rose above 100°, except immediately after operation.

Post-mortem Examination.—The patient died on December 9th. The brain appeared healthy. There was an open laminectomy over the dorsal spine still draining pus. This seemed to be coming from the front of the cord round the left side. On removal of the cord there was evident erosion of the back of the bodies of the first and second lumbar vertebrae. On opening the dura the arachnoid was seen to be infiltrated with purulent lymph over the lumbar enlargement. From pus removed at operation, on November 29th, a heavy growth of *Staphylococcus aureus* was obtained in culture.

Discussion

This patient gave a definite history of a boil on the chin three weeks before the onset of acute osteomyelitis. The boil was not treated by incision. On first examination paraplegia was found to be present, and an acute transverse lesion of the cord was diagnosed, probably myelitis; but the rapid change in the patient's condition led to the conclusion that this was a case of compression of spinal cord. The sensory changes were just as predominant as motor changes. There was improvement after operation, but, as the post-mortem demonstrates, she had a ventral abscess resulting from the disease of the bodies of the vertebrae, and had developed spinal meningitis, which caused her death.

I am grateful to Dr. Gordon Holmes and Dr. Greenfield for their kind permission to publish these notes.

G. Faldella, writing in the July 31st issue of *Riv. di Patol. e Clin. Tuberc.*, maintains that the only truly active and effective method of treating early pulmonary infiltration in its various stages consists in a carefully performed artificial pneumothorax, followed by a good collapse of the lung, continued for a variable time in different cases, but usually only for a short period. Conservative and expectant treatment, if carried on under the supervision of a competent physician under conditions of bodily and mental rest in a modern sanatorium, may be reserved for exceptional cases in which the lesion is in the very earliest stage and there are few or no bacilli in the sputum, no haemoptysis, and no signs of intoxication. Owing to the extreme sensitiveness of these infiltrations to stimuli of any kind, it is important to avoid any strain or stimuli of a clinical, climatic, emotional, or other character. Symptomatic remedies may be of value if used carefully. The best treatment for early pulmonary infiltration therefore consists of artificial pneumothorax, a hygienic mode of life, rest, and symptomatic remedies, followed by climatotherapy.

Clinical Memoranda

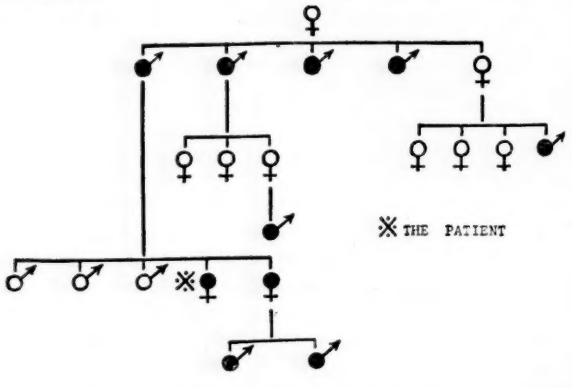
FEMALE "BLEEDERS"

While it is not generally admitted that haemophilia can exist in females, it is certain that there are clinicians who are becoming persuaded that the curt statements to that effect in standard textbooks cannot wholly be justified.

CASE RECORD

The "bleeder" who we briefly discuss here came to us on the third day of her puerperium. A primipara, she had a precipitate labour, and was admitted to hospital after two brisk haemorrhages accompanied by continuous vaginal oozing. A fully trained nurse, she maintained that she was a female haemophiliac, and was supported in this statement by her sister, who claimed the same distinction, and was also a nurse. Both came of bleeder stock, as is shown below, and both had had repeated prolonged haemorrhages from trivial causes. Our patient had been *in extremis* on one occasion from tooth extraction. When the occasion arose for her sister to have a major gynaecological operation her assertion that she was a bleeder was wisely confirmed by the finding of a prolonged clotting time, and only minor measures were adopted.

So far as it can be traced the genealogy of these two sisters is as follows:



While one did not wholly accept the stories of our patient and her relative, an examination under gas and oxygen showed that her condition was no ordinary post-partum haemorrhage, the interior of the uterus being perfectly normal for her period of the puerperium. The bleeding was from a serious vaginal laceration, which was oozing from no particular point, and which was mildly septic. This was packed firmly, and a very necessary blood transfusion given with prompt excellent results.

DISCUSSION

Two points may be given particular notice. First, there is the existence of two female bleeders in a known haemophilic family. We use the term "bleeder" in deference to those who maintain that a female haemophiliac is beyond reason. That these two might be purpuric is not impossible, but the fact that the two sons of one of them are both haemophiliacs is suggestive. What may happen to the male child whose birth brought this question to our notice it is yet too soon to predict. The second point is the transmission of a tendency to bleeding to his daughters by a haemophilic male, and those daughters having also the classical taint. It is also worthy of note that the male issue of this haemophilic man is without symptoms, and his sons have had tonsils and adenoids removed without trouble. One uncle of our patient also appears to have transmitted the tendency to a daughter, who is the mother of a definite male bleeder. The least dogmatic authority at our disposal states that a haemophilic man rarely transmits the disease to his sons or the tendency to his daughters. If this is haemophilia it is surely an outstanding example.

M. A. FOULIS, M.D.
J. W. CRAWFORD, M.D.

Glasgow.

Reviews

ACUTE INFECTIOUS DISEASES

An important new work on Acute Infectious Diseases[1] fills the first volume of the Handbook of Internal Medicine, originally edited by Professors Mohr and Staehelin, and now under the editorship of Professors G. VON BERGMANN of Berlin and R. STAEHELIN of Basle, with the collaboration of Professor VON SALLE of Berlin. The whole subject of acute infectious diseases is now contained in a single enormous volume, in contrast with the previous edition, in which it occupied two, each of them more truly deserving the title of handbook than the present somewhat unwieldy tome. The work, which comprises the contributions of seventeen well-known authorities in Germany and Switzerland, deals not only with the acute infections of temperate climates including acute articular rheumatism and miliary tuberculosis, but also with tropical diseases.

The first articles, written by Professor Gustav Liebermeister of Duren, consist of introductory matter and an essay on septicaemia. Among the other contributors are Professor Carl Hegler of Hamburg, co-editor of the second edition of Jochmann's textbook on infectious diseases and author of a monograph (noticed in our issue of May 26th, 1934, p. 950), who writes on acute articular rheumatism, erysipelas, erysipeloid, psittacosis, plague, and tularaemia, and Professor Ulrich Friedemann, formerly head of the department for infectious diseases at the Rudolf Virchow Hospital, Berlin, who contributes an exhaustive and up-to-date article on diphtheria. Professor Eduard Glanzmann of Berne discusses all the acute exanthemata, except small-pox, which is considered by Dr. Albert Eckstein of Düsseldorf; and Professor Alfred Schittenhelm of Kiel contributes the articles on serum sickness, tetanus, dysentery, undulant fever, typhus, Volhynian fever, Haff sickness, and Weil's disease. Professor Felix Lommel of Jena discusses actinomycosis, glanders, foot-and-mouth disease, trichinosis, anthrax, and rabies; and Professor Werner Schultz, who first described agranulocytosis in 1922, has been given the article on the various forms of faucial angina. Professor Rudolf Massini of Basle writes on influenza and herpetic fever, Professor Max Klotz of Lübeck on whooping-cough and mumps, and Professor Morawitz of Leipzig on acute poliomyelitis and cerebro-spinal fever. The contributors to the section on tropical diseases are Professor Carl Hegler and Professor E. G. Nauck of Hamburg, who deal with the various forms of malaria, relapsing fever, rat-bite fever, trypanosomiasis, dengue, Japanese river fever, and yellow fever; Professor Victor Klingmüller of Kiel, who discusses leprosy; and Professors Herbert Elias of Vienna and R. Doerr of Basle, who deal with cholera.

The most important articles in the work, in the reviewer's opinion, are those by Professor Glanzmann on the acute exanthemata and by Professor Friedemann on diphtheria. Unlike many Continental authorities, Professor Glanzmann appears to accept the streptococcal aetiology of scarlet fever, and is convinced of the value of the specific antitoxin, which, however, he regards as unnecessary in the treatment of mild cases. In his description of rubella he emphasizes the close clinical and epidemiological relationship of the exanthem to glandular fever, and classifies them both under the heading of benign lymphoblastoses, in distinction from the malignant leukaemic lymphoblastoses. In spite of an extensive experience of the acute exanthemata he has never met

[1] *Infektionskrankheiten. Handbuch der inneren Medizin.* Erster Band. Dritte Auflage. Herausgegeben von G. von Bergmann und R. Staehelin unter Mitwirkung von v. Salle. Berlin: Julius Springer. 1934. (Pp. xvi + 1,299; illustrated. R.M. 90; geb., R.M. 96.)

with a clinical picture to which the term " fourth disease " is applicable, and he appears to agree with Rietschel and other authorities (including the reviewer) that what have been described by this title are mostly mild cases of scarlet fever and probably other exanthemata, especially rubella. As regards the dosage of diphtheria antitoxin Professor Friedemann occupies an intermediate position between those who favour comparatively small doses and those who regard enormous quantities as essential. He is sceptical as to the value of antitoxin in diphtheritic paralysis.

The bibliographies appended to the articles of each contributor are of a more international character than those often found in German works of reference. This statement applies particularly to Professor Friedemann's article on diphtheria, in which British and American, French and Scandinavian, as well as German literature receives due acknowledgement. The text is liberally interspersed with photographs, temperature charts, microphotographs, and other illustrations, some of which are in colour. The work as a whole, emanating as it does from the best-known authorities on the subject in Germany and Switzerland, is a valuable addition to the literature of acute infectious diseases.

CLINICAL PATHOLOGY

It is now twenty years since PANTON'S *Clinical Pathology* was first published, and six years since the second edition appeared. Throughout these years the book has been regarded by clinical pathologists as one of the most useful introductions to the subject in the English language. In fact, it may be described as indispensable to any practising clinical pathologist. The new edition,[2] in which a great deal of the text has been rewritten and rearranged, looks at first sight much like its predecessors, but in reading through the book one notices many changes. Most of these are definite improvements, such as better ways of performing tests or clearer interpretations of the significance of the results. There are, however, some rather antiquated methods which survive the pruning, such as the method of counting leucocytes described on page 39. Many of the tests could be done equally well by other methods, but it has been a good policy to restrict description to reliable methods of which the authors have experience rather than to offer a large number of alternatives.

Having very little to say in criticism of the general method and contents a reviewer may perhaps be allowed to point out certain mistakes in expression which are out of place in a book that has come to be regarded as a standard work. There are many poorly phrased ideas or ambiguous passages, such as the following (p. 52), which we hope will not be noticed across the Channel. " It has been maintained, particularly in France, that the high blood cholesterol is found in patients with gall stones, but *more trustworthy workers* [our italics] have failed to find figures appreciably above the normal in cases with obstructive jaundice." As examples of ambiguity we might draw attention to the following. Writing of pleural effusions the authors say: " Almost any variety of cell may on rare occasions be found in these fluids. The eosinophil cell is exceptionally predominant " (p. 260). Or again, this curious comment on the fractional test meal: " The sole difficulty in the procedure lies in the withdrawal of the test meal, in reality a very simple manœuvre " (p. 350) ; or this on the bacteriology of the urine: " Pneumococci in the urine are often recorded but rarely found " (p. 339). Other hazy sentences are found here and there, except in Section VIII, dealing with histology. Like previous editions the present volume is well illustrated and accurately indexed.

[2] *Clinical Pathology*. By P. N. Panton, M.A., M.B., B.Ch., and J. R. Marrack, M.A., M.D. Third edition. London: J. and A. Churchill, Ltd. 1934. (Pp. 484 ; 50 figures, 12 plates (10 coloured). 15s.)

GONOCOCCAL INFECTION

The subtitle of *Gonococcal Infection : Recent Advances in Pathology, Diagnosis and Treatment*, by R. V. STORER,[3] is somewhat misleading ; the advances may exist in the author's mind, but some of them will be accepted with considerable reserve by venereologists in general. Many of the views expressed—more particularly concerning the prostate and prostatitis—are sound and in accord with accepted principles, but others are frankly heretical ; many of the latter are stated as facts, whereas they merely represent the author's opinion. This little book contains far too many errors—such as that one ounce of 1 per cent. potassium permanganate added to two pints of water makes a solution of 1 in 8,000—and the pontifical and dogmatic attitude of the author invites the question, " Who is Dr. Storer, and by what authority does he make these statements?" The answer is not vouchsafed us. There is no index, and, though many names are mentioned, references are few. The general practitioner who shows an " intelligent interest " by reading this book will probably get some severe shocks.

INDUSTRIAL MALADIES

In a graceful preface Dr. S. A. Henry of the Factory Department of the Home Office gives an interesting and informative biographical sketch of the late Sir THOMAS LEGGE, for several years senior medical inspector of factories. It was a disappointment to those who knew him intimately, and had worked with him, also to many medical men who only knew him through his writings, when, in 1926, Legge retired from the Home Office. The circumstance was not without its repercussion, for it left him with an amount of leisure which was foreign to him. He died on May 7th, 1932, at the age of 69. In *Industrial Maladies*[4] he has left a book which will live. It was a fortunate choice on the part of the Home Secretary and Sir Arthur Whitelegge when, in 1898, Dr. Thomas Legge was appointed the first medical inspector of factories, for the work not only appealed to him, but supplied him with the opportunity of rendering services he loved to give. The occasion was opportune, for there had risen in this country a wave of public opinion and a sympathetic consideration for the health of the working classes. Lead poisoning, phosphorus poisoning in the manufacturing of lucifer matches, and lead poisoning in the manufacture of pottery had just been subjects of departmental inquiry, and had been reported upon to the Home Office, while in 1895 certain occupational diseases had become notifiable. The foundation was thus laid, and upon it Legge reared his stately fabric. One of his helpful contributions to the elucidation of industrial poisoning is the part played by dust inhaled by the respiratory passages as against other possible channels of entrance, such as the alimentary canal and skin. Experience has confirmed the validity of his contention.

Considerable space is given in the treatise to the subject of lead poisoning, and statistics are appropriately applied. A few years ago it was observed that the number of cases

[3] *Gonococcal Infection. Recent Advances in Pathology, Diagnosis, and Treatment*. By Robert V. Storer, M.R.C.S., L.R.C.P. With Foreword by Kenneth M. Walker, F.R.C.S. London: J. Bale Sons and Danielsson, Ltd. 1934. (Pp. 91. 7s. 6d. net.)

[4] *Industrial Maladies*. By Sir Thomas Legge, C.B.E., M.D., D.P.H. Edited by S. A. Henry, M.A., M.D., D.P.H., D.T.M. London: H. Milford, Oxford University Press. 1934. (P. 234 ; 13 figures. 12s. 6d. net.)

of plumbism had increased in house painters. This was followed by a decline, mainly due to the recommendation of C. A. Klein to substitute the "wet" for the "dry" method of rubbing down of painted surfaces. It is not only a satisfaction to observe the reduction of the occupational mortality of lead poisoning generally in this and other countries, but interesting to note the change in the symptomatology of the malady. Lead poisoning has lost much of its severity: its symptoms are milder. Colic with constipation, anaemia, and headache remain the triad of its early symptomatology: wrist-drop follows, as a rule, later, while in one of the acute forms of the toxaemia severe headache, convulsions, and coma seldom occur to-day compared with three decades ago. Contracted kidneys and thickened arteries still remain the final pathological finding in chronic plumbism. Allusion is made in the text to the important research work by Aub and his colleagues in Harvard University, and especially to the circumstance of the metal in the body being transported by the blood stream in the form of colloidal lead phosphate, and of being deposited in the bone tissues as a rather insoluble tertiary lead phosphate.

There is hardly any subject of industrial medicine which is not dealt with in the book. The chapters on metallic poisoning, generally, and the harmful effects of gases, bear evidence of careful preparation, as do also the pages devoted to benzene and its homologues. Such subjects as mule-spinners' cancer, silicosis, and pulmonary asbestosis are also adequately reviewed. Sir Thomas Legge has left a valuable contribution to the subject of occupational maladies. High praise is due to the editor, Dr. S. A. Henry, for the efficient manner in which he has discharged a fraternal task.

MEDICO-LEGAL NECROPSIES

The Medicolegal Necropsy[5] is an American publication of 167 pages, consisting of an introduction and six papers delivered at a symposium of the American Society of Clinical Pathologists in June, 1933, dealing with the determination of the cause of death in supposedly criminal cases. The collection, which is edited by the chairman of the society's committee on necropsies (who has also written the introduction), includes papers on "The Medical Examiner's Findings in Deaths from Shooting, Stabbing, Cutting, and Asphyxia," by H. S. Martland, the professor of forensic medicine in New York University; "Toxicology in the Medicolegal Necropsy," by Alex O. Gettler, toxicologist to the chief medical examiner's office, New York City; "Pathological Anatomy of Death by Drowning," by E. L. Miloslavich of the Institute of Legal Medicine, Yugoslavia; "The Medicolegal System of the United States, by O. T. Schultz; and two papers on "The Medicolegal Necropsy," by A. V. St. George and Charles Norris, chief medical examiner, New York City. The first forty pages are a condemnation of the coroner system. The evidence brought forward for its abolition and replacement by a medico-legal institute will strike many readers as most convincing, and the statement is made that "the superiority of the medical examiner system in those populous communities where the system has been tried is without question."

The experience of some of the contributors will be realized when it is seen that over two thousand human bodies are analysed annually in Dr. Gettler's department, and that during the five-year period 1928–32 there were 2,457 homicides in New York City. Their conclusions as to the best system to be adopted for carrying out these investigations are not to be lightly put aside. The importance of a detailed post-mortem examination in cases of fatal street accidents is emphasized by the chief medical examiner, New York City, and is of interest in connexion with the present road safety campaign in this country. He stresses the point that alcoholism, not only of the drivers, but also of pedestrians, is a large causal factor, and states that the statistics of his office show that in nearly 25 per cent. of deaths in street accidents a full post-mortem examination proved the victims to have been drunk at the time of their death. Dr. Miloslavich draws attention to several not widely recognized effects of drowning, especially to haemorrhages in the tissues of the neck, which may lead to an assumption of strangulation; and the last paper, by Professor Martland, which is profusely illustrated, deals shortly with various causes of violent death.

This publication expresses the trend of opinion among workers of enormous experience in this branch of medicine, as to the requirements of a modern community in the investigation of sudden deaths; and, though not containing much scientific detail, it is both stimulating and valuable.

[5] *The Medicolegal Necropsy. A Symposium held at the Twelfth Annual Convention of the American Society of Clinical Pathologists at Milwaukee, Wisconsin, June 9th, 1933.* Edited for the Society by Thomas B. Magath. London: Baillière, Tindall and Cox. 1934. (Pp. 167; 59 figures. 11s. 6d.)

ESSENTIALS OF HISTOLOGY

It is nearly fifty years since Sir E. SHARPEY-SCHAFER'S *Essentials of Histology* first appeared. On its appearance it immediately took its position as the standard textbook of histology for students in this country, and it has maintained that position in the twelve editions that have subsequently appeared. The enormous advances in knowledge and method which have been made in the interval give the recently issued thirteenth edition[6] the appearance, by comparison, almost of a new work. By those, however, who knew the original, many features, in illustrations directions, and arrangement, will be recognized, and the characteristic qualities of the work remain unchanged. The editorship of the present edition has been entrusted to Dr. H. M. CARLETON. He has made no considerable changes, but certain portions, such as the sections on the development of blood corpuscles and on ossification, have been rewritten. A number of the older illustrations have been replaced by new figures, mainly photographs of microscopical preparations. Of the figures themselves, with which the book is copiously illustrated, it is impossible to speak too highly.

Notes on Books

In his essay on the Aetiology of Infectious Diseases[7] Dr. RAPPIN, who is honorary professor of the medical school and director of the Pasteur Institute of Nantes, in collaboration with Dr. DOUSSAIN makes a claim on behalf of the old conception of diathesis, constitution, and temperament, which, he maintains, should not be entirely discarded in favour of the exogenous origin of infectious diseases. Instead of the system of the individual being regarded as entirely passive, and being ready to allow micro-organisms from outside to invade it, the view should be held that microbic disease may be the result of a spontaneous deviation of an organic function, the micro-organisms in such cases originating in the system itself.

The little work on *German Medicine*[8] in the Clio Medica Series has been compiled by Professor WILHELM HABERLING, who occupies the chair of the History of Medicine in the Medical Academy at Düsseldorf. Within a small

[6] *Essentials of Histology, Descriptive and Practical.* By Sir E. Sharpey-Schafer, F.R.S. Thirteenth edition, edited by H. M. Carleton, M.A., B.Sc., D.Phil. London: Longmans, Green and Co. 1934. (Pp. 618; 721 figures. 15s. net.)

[7] *Considérations sur l'Étiologie des Maladies Infectieuses.* By Dr. Rappin, in collaboration with Dr. Doussain. Nantes: Imprimerie de Bretagne. 1933. (Pp. 136; illustrated.)

[8] *German Medicine.* By W. Haberling, M.D. Translated by Jules Freund, M.D. New York: Paul B. Hoeber, Inc. 1934. (Pp. 160; 9 figures. 1.50 dollars.)

compass the book gives an excellent summary of the contributions to medicine by German workers from the earliest times until the present day, special chapters being devoted to German medicine in the Renaissance, with special reference to Paracelsus ; the seventeenth century, when the teachings of Paracelsus were further developed in the iatrochemical and iatrophysical schools; the eighteenth century, in which the most prominent representatives were Friedrich Hoffmann, Stahl, Albrecht von Haller, and van Swieten ; and modern times. The text is accompanied by portraits of Paracelsus, Haller, Johannes Müller, Schwann, Virchow, Koch, Ehrlich, Roentgen, and von Pettenkofer.

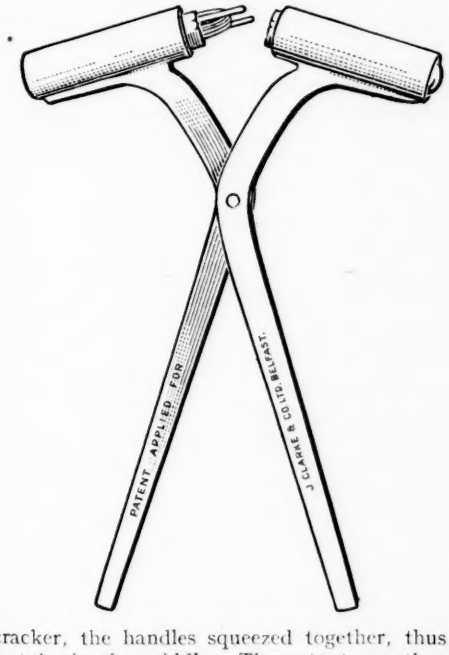
Mr. SIDNEY B. WHIPPLE's book entitled *Noble Experiment*[9] contains the history of the origin and progress of the prohibition movement, for which, as is well known, ex-President Hoover used the term that forms the title of the work. While giving a highly sensational account of the activities of all concerned in the production and supply of illegal liquor, it entirely ignores the hygienic and economic benefits conferred by prohibition, particularly in the early period, when enforcement was more rigorously carried out. The optimistic note upon which the book ends has not been confirmed by the latest information from the United States, according to which there has been an increase in drunkenness, motor accidents, and arrests for crime since the repeal of the Volstead Act.

[9] *Noble Experiment. A Portrait of America under Prohibition.* By Sidney B. Whipple. London: Methuen and Co., Ltd. 1934. (Pp. 184. 5s. net.)

Preparations and Appliances

CATGUT TUBE CRACKER

Mr. W. R. MACKENZIE, F.C.O.G. (Belfast), writes: To overcome the difficulty of breaking "catgut tubes" and save the risk of tearing gloves I have had made for my own use a breaker which is both practical and satisfactory. It consists of two short tubes, one of which is closed at one end, mounted on curved handles hinged together at the centre, which act "anti-scissor-wise." The end of the catgut tube is placed



in the cracker, the handles squeezed together, thus breaking the glass tube in the middle. The catgut can then be lifted out with dissecting forceps without touching the glass. The great advantage of the instrument is that the catgut tubes are not touched. If they are placed in a basin of lotion they can be scooped up into the cracker and broken with one hand. This cracker has been made for me by John Clarke and Co. (Succrs.), Ltd., 8, Donegall Square West, Belfast.

MASTOID RETRACTOR

Mr. REGINALD H. SMITH, D.L.O. (Manchester), writes:

Below is described a mastoid retractor which I have designed and have found useful in practice. The two blades carry five teeth each. Three are for the main or central part of the incision, and the two shorter ones, fitting in the lower part of the incision, are carried on the terminal part of the blade, which is curved inwards. This inward curving of the blades, together with the fact that only three teeth are used for the central part of the incision, prevents the lower end

of the incision being stretched and drawn upwards. The instrument is designed with the object of attaining a more satisfactory and adequate exposure of the mastoid cortex—especially the tip, which frequently offers difficulties when instrumental manipulations have to be made. It has the further advantage of holding itself very securely on the wound, and has no tendency to "jump out" while the operation is in progress. It thus gives easy access to the field of work.

I am indebted to Messrs. Mayer and Phelps for the production of this instrument.

ALLENBURYS' URINACIDOMETER

The "Allenburys" urinacidometer has been designed by Allen and Hanburys Ltd. (Bethnal Green, E.2) in order to provide the physician with means for rapidly determining the *p*H of urine samples from patients who are on a ketogenic diet. It is based upon the use of coloured charts, the colours of which have been matched against samples of urine tinted with the indicators prescribed, and are examined in the special flat test tubes provided in the set. The outfit is contained in a neat japanned metal box, $7\frac{1}{2}$ in. by $4\frac{1}{2}$ in. by $2\frac{1}{2}$ in. ; and its price, complete, is 45s.

MEASUREMENT OF VITAMIN A

The replacement of biological methods of standardization by physical or chemical methods is always desirable, but this is particularly true in the case of vitamins, where the biological methods are expensive both in time and in material, since they involve the special feeding of populations of experimental animals for months.

The estimation of the vitamin A content of liver oils was greatly facilitated by the discovery that the vitamin A potency was proportional to the intensity of blue colour developed on the addition of antimony trichloride. The use of this method, however, involves a certain amount of chemical skill, and even when used correctly it sometimes gives unsatisfactory results. The estimation of vitamin A has now been reduced to extreme simplicity by means of a spectrophotometer designed by Messrs. Adam Hilger (98, King's Road, Camden Town, N.W.1). Vitamin A shows an absorption band at 3280 A, and the apparatus measures the amount of absorption that occurs at this wave-length. The light that passes through the solution falls on a fluorescent screen, and the image formed thereby is matched against a second image, the intensity of which is varied by means of an adjustable aperture. A scale reading proportional to the concentration of vitamin A is thus obtained. The makers claim that any reasonably intelligent operator without any specialized training can estimate the vitamin A content of a liver oil, since the instrument dispenses with the use of chemical reagents and with the need for colour discrimination.

The instrument provides an interesting example of the way in which the ingenuity of the manufacturer of physical apparatus can provide instruments which act as substitutes for human skill. The biological tests for vitamin A require a wide range of specialized knowledge and experience: even the chemical test requires adequate training in special chemical methods, but with this instrument it is simply necessary to move a lever until two lines of light become equally bright. The price of the instrument is only £35, which is not more than the cost of a few biological estimations of vitamin A.

STATE OF THE PUBLIC HEALTH

SIR GEORGE NEWMAN'S REPORT

The assessment of the health of a nation—as, indeed, of an individual—is attended by obvious difficulties. Health is a condition of balance, an imponderable state, "a kind of temper," as John Arbuthnot expressed it, "gotten and preserved by a convenient mixture of contraries," only to be brought within the statistical compass by recording the departures from it. Sir George Newman's annual volume—the sixteenth above his signature—is entitled *On the State of the Public Health*,[1] but it has to be concerned in the main with the study of sickness, incapacity, and mortality. Only in that way can any standard of health be deduced, and even then the standard is relative and inexact. We have an impression that if there were any practical means, such as a periodical assay of the physique of the individuals composing the nation, of expressing national health in positive, instead of negative, terms, the result would be even more encouraging than the figures and inferences in this document concerning the lessening incidence of certain common diseases.

INFANT AND CHILD MORTALITY

Even on such statistical basis as offers itself, the picture, though not without shadows, is a bright one. The crudest of all measurements is the death rate, and here the death rate for the whole population, the infant and child mortality rates, and the particular death rates for measles, whooping-cough, tuberculosis, diphtheria, scarlet fever, small-pox, and rickets have steadily declined for a generation past. The infant mortality rate is now 64 per 1,000 births registered; in the last pre-war year it was 108. It should be added that the improvement relates principally to infants over 1 month old. During the first month of life the mortality is not much less than it was twenty years ago (32 per 1,000, as against 39). Until the early years of the present century the highest infant mortality, owing to the prevalence of epidemic diarrhoea, was in the July–September quarter. The hottest months levied the greatest toll from infancy; the coldest gave the highest general death rate. This difference has now disappeared, and the July–September quarter gives the lowest death rate for infants, as it does for the rest of the population.

Does the pre-school child show a similar improvement in respect of mortality? A statistical review covering this point, for which Professor Major Greenwood and Dr. Bradford Hill are responsible, is embodied in the report, and shows that in spite of the relative absence of direct action by public health services on behalf of the pre-school child, the greatest improvement in mortality for the past three-quarters of a century has been recorded in the ages 1 to 5 years. With the exception of influenza, all the major causes of death in early childhood show a decline as compared even with the immediate pre-war period. The mortality among adolescents, another relatively neglected class, shows the same trend. It may be noted that tuberculosis, the dominating cause of mortality in adolescence, has receded more markedly among boys than among girls.

One cause of death which reflects itself in the tables both for children and for adolescents is a cause of which Sir George Newman's predecessors cannot have taken much cognizance—namely, road accidents. Out of every 1,000 people who die in this country forty-six reach a violent end, and a principal cause of deaths attributed to violence is the state of the highway. The number of persons killed on the road last year was 6,498, far exceeding the total of suicides and homicides. Sir George Newman permits himself a little homily to the pedestrian, but it rather misses its mark so far as the young child victims—a very large proportion of the whole—are concerned.

STILL NO EVIDENCE OF WIDESPREAD MALNUTRITION

The conclusion set out in last year's report, that there is no widespread malnutrition in spite of economic and social difficulties, is repeated. Evidence collected from various parts of the country, including the distressed areas, indicates that the health of the unemployed and their dependants is, as a whole, not suffering seriously or generally, though it is evident that some of the unemployed men and many of the women and children in the distressed areas are showing the physical signs of prolonged deprivation. The best that can be said is that it is not a deprivation comparable with that of certain periods of the nineteenth century, thanks to the comprehensive resources of public assistance and mutual aid now existing.

Excerpts are given from the reports of medical officers of health and school medical officers in centres where malnutrition might be expected. We make a few representative quotations:

County of London.—" . . . in view of the fact that the selection of schools and age group was made with the direct purpose of discovering the worst, the percentage of children found to be below par is surprisingly small."

Monmouthshire.—" . . . no increase in malnutrition in the school children."

Nottinghamshire.—" . . . no evidence in this county of any definite deterioration in the nutrition of the elementary school children."

Yorkshire (East Riding).—" . . . no evidence of a lowered standard of nutrition."

Yorkshire (West Riding).—" The bulk of the children may be said to be in a reasonable condition of well-being."

Birmingham.—" . . . the children in the city do not show evidence of that malnutrition which is encountered in those areas of the country which have gone through the long period of depression."

Bristol.—" . . . it cannot be said that malnutrition among school children in the city really exists."

Liverpool.—" . . . it does not appear from the evidence that, taking the children as a whole, there has been any increase in the prevalence of malnutrition."

Manchester.—" Malnutrition and rickets to-day only exist among Manchester school children to half the extent to which they did five years ago."

Newcastle-upon-Tyne.—" . . . our figures show an improvement upon those of 1932 and 1931."

Sheffield.—" . . . no falling off in the nutrition of Sheffield elementary school children in spite of hard times."

An inquiry made by the regional medical staff in April, 1934, told the same story—malnutrition not prominent, widespread, or increasing, chiefly reported from Tyneside and dockyard areas on the north-east seaboard, but even there not affecting more than a small proportion of the adult population, and almost entirely absent from the reports from South Wales. So far as the death rate is any criterion, of the six English and Welsh counties most seriously affected by unemployment and industrial depression in 1933 two had a general death rate actually below the average for the country and in the other counties it was only slightly higher. Of the fourteen county boroughs to which the same description applies, three were below the national average and only two (in Lancashire) markedly above it. The infant death rate, however, in nearly all areas was above the national average, often well above.

[1] *On the State of the Public Health.* Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1933. (H.M. Stationery Office. 4s. 6d. net.)

The conclusion drawn by Sir George Newman is that for more than twenty years the nutrition of the people has been steadily improving, but the problem which remains is far too complex to solve by a model menu; it calls for still further education of the public in personal health, the understanding of the needs of the body, and the wiser choice of foods.

THE TOLL OF MATERNITY

The curve for puerperal mortality is still slightly in the ascendant. The 1933 figure of 4.51 per 1,000 live births registered is the highest in the table, which goes back to 1911. Up to 1924 the rate rarely exceeded 4 per 1,000; since then it has exceeded it every year. The number of mothers who died as a direct consequence of childbirth was 2,618. These ten years of rising incidence have also been years during which an organized effort has been made to reduce the casualties of maternity. Time must be allowed, of course, before the effect of such efforts can be felt, but it is disappointing to find the number of births dramatically falling year by year—the number in 1933 was only two-thirds of the number in 1913—while the maternal mortality remains obstinately high.

One feature which calls both for hopefulness and for inquiry is the fact that the high rate is not evened out over the whole country. There are certain areas which are chiefly responsible for its continuance over a long period. Sir George Newman blacklists thirty-six areas which have had for ten years past an average maternal mortality of above 5 per 1,000 births. Certain Welsh counties and Lancashire boroughs lead the way. "Is it asking too much," he says, "of the authorities responsible for the health governance of these thirty-six sanitary districts to call for a report of this high maternal death rate (if they have not already done so), and then give careful consideration to its contents?" As a contrast he gives the figures for a number of institutions dealing with many thousands of lying-in cases, where the average maternal mortality for ten years has never reached 2 per 1,000. Among 600,000 district midwifery cases of the Queen's Institute of District Nursing the average maternal mortality for ten years has been 1.91.

The continuing high death rate can be assigned to several causes. Inquiries into the deaths of women in childbirth during 1933 showed that in 23 per cent. of them the absence of effective ante-natal supervision contributed to the fatal issue. The ante-natal clinics are insufficiently used, according to Sir George Newman; advice by practitioners is not given as commonly and as customarily as it should be, and in many cases the ante-natal supervision in clinics, in hospital, and in private practice is at present perfunctory, unskilled, or incomplete. Another factor is the neglect of the nutrition of the mother during pregnancy, and yet another, too much or untimely intervention.

ABORTION: CONTRACEPTION

In connexion with the figures for maternal mortality one point which seems rather important is made, not in the report before us, but in the recently issued annual report of the London County Council.[2] The maternal mortality rate is arrived at by dividing the number of registered births (580,413 in England and Wales in 1933) into the number of deaths recorded as due to pregnancy and parturition (2,618 in that year), giving the figure of 4.51 per 1,000. But whereas in the total of deaths those from miscarriage and abortion are included, the total number of miscarriages and abortions among which these deaths occurred is not added to the total of births. The births necessarily in general relate to pregnancies of more than twenty-eight weeks' gestation, but the deaths also include those occurring before the twenty-eighth week, and consequently all abortions, even of single women, of which latter a far greater proportion are septic than of married women. This does seem to be a point on which some revision of the statistical method is desirable.

In discussing the question of abortion Sir George Newman points out a primary difficulty with which also the new committee set up by the Council of the British Medical Association will be faced—namely, that there is no system of notification of abortion in this country, and statistical information as to an increase in its occurrence is wholly lacking. It has been estimated that about one in seven pregnancies terminates in abortion, but the figures on which the estimate is based cannot be assumed to furnish a true index of frequency. In 1933 the deaths attributed to abortion in England and Wales numbered 463, of which 257 were due to post-abortive sepsis, being 24.2 per cent. of the total deaths from puerperal sepsis; 121 were due to abortion not returned as septic, and eighty-five were classed as criminal abortions (inquest cases), of which in sixty-eight there had been instrumental interference, while three were known to be due to drugs. In addition, ninety-seven deaths were associated with abortion, though not classed to it. Sir George Newman stresses the need for suitable accommodation for cases of abortion.

The report contains a statement which may be regarded as the considered answer of the Ministry of Health to those who urge local authorities to provide facilities for the practice of artificial contraception. The advocacy of indiscriminate and unskilled contraception has substantial disadvantages: organized instruction might become propagandist, and lead to the commercial exploitation of the means, and the means themselves might be deleterious in their social or physical results, and used for selfishness and debasement. It is not the function of an ante-natal centre to give advice with regard to birth control. In exceptional cases, where avoidance of pregnancy seems desirable on medical grounds, the woman attending a centre should be referred for particular advice on birth control to a private practitioner attached to, or recommended by, the centre or to a suitable hospital or clinic. There is no general statutory power enabling a local authority to establish birth control clinics as such. It is admitted, however, that such clinics are attended by many women who are in need of medical or surgical treatment of disease or discomfort, and the report suggests that possibly there is a place for a different kind of institution which would serve as an out-patient gynaecological clinic, where mothers needing advice on physical and health matters might be assisted. Such an institution under proper medical supervision could receive minor gynaecological cases, counsel mothers of subnormal physique or mentality, and give advice on the practice of contraceptive methods when medically needed. That, apparently, is as far as the Ministry will go.

The sections on general epidemiology, on tuberculosis, venereal diseases, and cancer, on the insurance medical service, and on hospital administration must await a later review.

The National Council for the Unmarried Mother and Her Child has issued a fourth edition of its leaflet entitled "A Few Points of the Law of England and Wales relating to Unmarried Mothers and Illegitimate Children." This is a matter on which the advice of medical practitioners is sought from time to time. Copies may be obtained (price 3d.) from the general secretary, Miss Susan Musson, 117, Piccadilly, London, W.1.

[2] *Annual Report of the London County Council, 1933.* Vol. iii (Part I), Public Health. Published by the L.C.C. (1s.)

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DEATH AND THE SURVIVAL OF RIGHTS OF ACTION

A recent change in the general law relating to the survival of rights of action after death is of considerable interest to members of the medical profession. For many centuries the law of England has been that *Actio personalis moritur cum persona*. Broadly speaking, the effect of this maxim was that if the victim of an injury caused by negligence died, whether in consequence of that negligence or from natural causes, his right of action died with him. His personal representatives could not continue a suit pending at the date of death, nor could they commence proceedings thereafter. To this rule an important exception was made by statute in the middle of last century, when, by an Act known as Lord Campbell's Act, it was provided that if death is *caused by negligence* those who were dependent upon the deceased might sue for compensation. But this right was conferred only upon a limited class of persons—for example, the parent or child of the deceased—and the amount of compensation recoverable had reference to the degree of "dependence." Again, the action must have been brought within one year of the date of death. To take a concrete example. If a patient dies in circumstances which expose the surgeon to an action for malpraxis, the right of action survives (by virtue of Lord Campbell's Act) to the dependants of the deceased.

But the law has now been altered. Not long since the Lord Chancellor appointed a committee, as the result of whose report an Act known as the Law Reform Act, 1934, was passed in July, 1934. It is with only one of the changes made by this Act that we are concerned. An action now lies or can be continued for damages for personal injury caused by negligence, notwithstanding the death of the victim, and whether the death was or was not caused by the negligence complained of. Furthermore, the action may be brought at any time within six years of the date of the injury. This change in the law is fraught with grave consequences to the medical profession. Consider one or two cases which may arise. A patient dies on the operating table. He may have submitted to the operation, knowing that it was his only hope. He may have been the last person in the world to charge the surgeon with negligence; yet the surgeon is exposed for six years to the risk of an action at the suit of those who are interested in the estate of the deceased. They need not even have been in any way related to or dependent upon him! Again, take the case of a patient who, having submitted to treatment or to an operation, subsequently dies as the result of some supervening injury or disease. The practitioner who attended him remains—for six years—exposed to the risk of an action, albeit the patient himself had no intention of bringing suit and no ground of complaint against his medical adviser. That the legislature had some compunction—some consideration for the *living* in so extending the right of action on behalf of *the dead*—is manifest, because the statute does do something to restrict the amount of damages which may be recovered for negligence causing death. Thus the court or a jury may not award exemplary damages; and damages caused to the estate merely as a result of the death are not to be awarded. For example, if an annuitant or a man enjoying a life interest were to die, the resulting loss to his estate must not be considered. On the other hand, a gain to the estate is not to be taken into account, as where, for example, a man dies whose life is insured.

Had Parliament been content to enact that actions pending at the time of a man's decease may be continued for the benefit of those who come after him there might have been little cause to complain. The proceedings would then have been commenced at the instance of the one person who best knew whether he had a righteous claim or not. But now members of the medical and all other professions are exposed to the risk of actions for negligence at the suit of persons to whom they owed no duty, and to whom they never desired to owe any duty. We can only wonder whether the committee which framed the report that has resulted in this change in the law took any of these matters into consideration in the course of its deliberations.

BRIGHT'S DISEASE

It was Bright's genius that recognized kidney disease as the common cause of a number of different disorders in which death occurs under such widely various circumstances as dropsy, acute inflammation, apoplexy, and uraemia, not one of which points evidently to the kidney as its source. And this brilliant generalization is in no way belittled by the fact that we no longer include under the heading of Bright's disease, as in his day, all kidney affections accompanied by oedema and albuminuria, reserving this term now for bilateral haematogenous renal disease caused by infection or damage to the kidneys incurred in their function as excretory organs. Indeed, Bright's original description can be transferred almost unmodified into the textbooks of the present day; and the clinical picture he drew is so true and proportioned that the subsequent hundred years of work and observation have only painted in the detail without essentially altering the broad outlines. Nevertheless, many advances have been made in our knowledge of renal disease, and these upon several lines.

Histological studies from the middle of last century showed that the essential structures of the kidney could be divided into at least three different parts: the capsule

of Bowman surrounding a knot of thin-walled capillaries, and two tubular portions, of which one was obviously secretory in function and supplied by a rich network of capillaries, while the function of the other was as obviously purely to conduct the secretion to the pelvis of the kidney. It was not till much later, however, that there arose the modern conception of nephrons as the units of which the kidney is built up. Each nephron consists of a glomerulus and its attached tubule. The blood supply of the nephron is peculiar in that the afferent artery breaks up into the knot of capillaries impinging into Bowman's capsule, and reunites in an efferent vessel, which breaks up again into capillaries distributed to the secreting tubule. There is thus a double supply of capillaries to each secretory unit. The kidney is, as it were, a composite secretory organ in which each floret of the daisy head has this double capillary supply. Such a conception has brought harmony into the hitherto discordant theories of urinary secretion, and has enabled a modern theory to be enunciated which accords so well with the results obtained in experimental physiology and pathology as to warrant acceptance. According to this theory the soluble and diffusible substances of the blood are filtered off through the thin capillary wall, which holds back only the cells, proteins, and other colloids, and pass into the lumen of the tubule, where an active secretion brings about a reabsorption of enough of those substances which are useful to the body to raise them to a normal threshold value in the blood, allowing the remainder of the glomerular filtrate, together with the excess of water, to pass on into the collecting tubule and pelvis of the kidney, and so eventually to the exterior.

These conceptions of the structure and function of the kidney have contributed largely to a co-ordinated view of what goes wrong in disease, but the most vehement controversies have raged round the interpretation of the histological findings in the diseased kidney, and much haematoxylin has been spilt in trying to elucidate the problems involved. It is obvious that attempts would be made to differentiate lesions of the glomerulus from affections of the tubules, but the pathological classification into glomerular and tubular nephritis was found to have no regular correlation with the clinical condition of the patients before death. The final position reached in studies on these lines was that the kidney consisted of glomeruli, tubules, blood vessels, and interstitial tissue, and that in diseased kidneys all these four elements were affected in greater or less degree ; though of course differentiation could be made when affection of one of the four elements predominated. With glomerular destruction a haemorrhagic nephritis with more or less nitrogen retention occurs ; with arteriosclerotic changes in the small renal vessels there is early hypertension ; and with degeneration affecting mainly the tubules there tends to be oedema and proteinuria without haematuria or hypertension. Various names have been suggested for these groups ; Volhard and Fahr's classification into glomerulonephritis, nephrosclerosis, and nephrosis is perhaps as widely accepted as any. The first group includes acute nephritis and latent or progressive chronic nephritis leading to renal failure ; the second and third groups correspond roughly with the old classification into chronic interstitial and chronic parenchymatous nephritis respectively.

For years Volhard has held that, in the first group, acute glomerulonephritis starts with a toxic spasm of the glomerular capillaries. Recently, however, it has been possible, as Fahr[1] points out, to produce experimental lesions in rabbits by means of a specific nephrotoxin. The earliest lesion is found to be an endothelial proliferation which precedes the vascular changes ; these may be a hyperaemia or an emptying of the capillaries through pressure of exudation rather than a primary vascular spasm. In the chronic stages Volhard assumes that the spasm, at first reversible, becomes fixed by changes due to endarteritis. This endarteritis and necrosis of the arterial wall is not constant, and is more likely the result of the chronic glomerulonephritis, which is kept up by a mild continuous streptococcal infection. Even in the form which is progressive without apparent chronic infection, it is unnecessary to assume the intervention of vascular changes, since once the glomerular epithelium is sensitized it may be damaged further by the excretion of waste products which would not ordinarily affect healthy cells.

The term " nephrosis," introduced in Germany to cover cases of primary degenerative changes in tubules and glomeruli, and accepted in the United States, where many clinical examples have been recorded, has never really been adopted into British medicine. There are certain cases of Bright's disease in which the dominant features are prolonged proteinuria and oedema without accumulation of urea and nitrogenous products in the blood ; but the more carefully histological examinations are made the fewer remain in which no glomerular changes can be demonstrated. Professor Shaw Dunn,[2] in an admirable review of the present state of knowledge of the subject and from his own carefully conducted observations, concludes that in all these cases the primary lesion is in the glomerulus. He further suggests that a mild lesion widespread throughout the glomeruli, causing them to be constantly permeable instead of contracting and dilating at intervals as in health, will best explain the large amount of albuminuria which is combined in these cases with oedema and no retention of nitrogen, since all the damaged glomeruli are constantly patent and allow increased filtrate, while the slow trickle through the tubules consequent upon the absence of hypertension permits of increased reabsorption of salt and water. He regards the accumulation of lipoids in the tubules as entirely secondary, and brought about by the opportunity for increased absorption owing to the sluggish current in the lumen of the tubule. In the other forms of so-called nephrosis, lipoid or amyloid, again the tubular

[1] *Klin. Woch.*, April 28th, 1934, p. 609.
[2] *Journ. Path. and Bact.*, 1934, xxxix, 1.

accumulations are secondary, and in these cases are due to extrarenal causes; as also is the kidney of pregnancy, in which liver changes are as severe as the renal changes, and probably contribute more to the symptoms. In regard to the third group, it is perhaps too early to decide that cases of nephrosclerosis are to be differentiated entirely from the essential renal lesion underlying Bright's disease. Leading pathologists would appear to be returning to the position taken up by Bright in his celebrated researches—namely, the unity of nephritis as an affection of the essential renal elements. As a river stagnating spreads out through channels and diverticula, these, though meandering, run roughly parallel till they join again into a stream that will bear forward the raft of medical knowledge.

RHEUMATISM AND THE "ACID CHILD"

The acid diathesis of rheumatism is a long-standing theory which is liable to be criticized when the vague general term is applied more particularly to the manifestations of rheumatic infection in childhood. An attempt to divide children into "acid" and "alkaline" types in a textbook[1] some years ago had an unpopular reception, and the suggestion that the rheumatic child fell into the first group was countered by Professor Leonard Parsons with a report[2] showing that examination of the hydrogen-ion concentration of the blood, for example, demonstrated no significant difference in the rheumatic as compared with the normal child. In the August issue of the *Archives of Disease in Childhood* Dr. W. W. Payne, biochemist at the Hospital for Sick Children, Great Ormond Street, attacks the problem in another way. He points out that in a normal functioning body the blood may very well fail to show changes in the acid-base regulation owing to the efficiency of the excretory organs. Of these the kidney is the most important, so that an examination of the acid output might reveal differences impossible to detect in the blood. The method adopted in testing this hypothesis was to take a group of about 200 children attending a "rheumatic clinic" and two control groups—one attending an "asthma clinic" and one of healthy children in a residential school. It was unfortunately not possible to secure a strictly comparable group of healthy children attending hospital, but Dr. Payne brings forward strong arguments to support his acceptance of the residential school children as strictly normal and comparable. Three specimens of urine were obtained from each child—that passed on rising, after breakfast, and on going to bed. The chemical examination included estimation of the hydrogen-ion concentration, free acid, ammonia, chlorides, phosphates, and urea. The methods used for expressing the results have been chosen to get over the difficulties of the large number of uncontrolled factors which can influence the fluid excretion of the body. By frequency curves and by a statistical analysis of the figures obtained it is shown that the asthmatic and rheumatic groups both differ from the controls. For free acid the two former groups show a significant excess over the normal; there is the same excess of total acid, while the normals also excreted less phosphate. Other minor differences are also present, all tending to indicate a real excess of acid excretion by the rheumatic and asthmatic groups. Unknown to Dr. Payne the latter group were all receiving hydrochloric acid as part of their treatment (1½ drachms daily in most instances). When a deduction is made from this in the results obtained the asthmatic group approaches very closely to the normal group as regards the excretion of acid, a point used to emphasize that the institutional children may be fairly used as controls. From the results obtained it would appear that Dr. Payne's hypothesis has been substantiated. He concludes that the rheumatic child in a quiescent interval excretes more acid in its urine than does either an asthmatic or a normal child. This excess production of acid is insufficient to disturb the equilibrium of the blood.

[1] *Recent Advances in Diseases of Children.* By W. J. Pearson and W. G. Wyllie. First edition.
[2] *Arch. Dis. in Child.*, 1926, iv, 291.

CHEESE-PARING AT GENEVA

The penny-wise people who have been so active in the League of Nations these last few years (writes our Geneva correspondent) have had their way, and it is an impoverished organization and depleted staff which waits upon the fifteenth Assembly. No fewer than fifty-eight posts in the Secretariat, out of six hundred or so, have been suppressed, at an annual saving of 500,000 Swiss francs, and the budget for 1935 is down by a corresponding amount. Despite this large reduction of staff, entailing the disappearance of some high officials who have been with the League since its beginning, we are assured that efficiency—blessed word!—has been maintained. The expenditure on the International Health Organization is only two-thirds of what it was in 1931, and it is frankly stated that any further reduction in its budget can only be obtained by serious curtailment of fundamental activities. But still the economizers—chiefly delegates from the British and Dominion Governments, for the Continental mind seems to be more emancipated in this respect—remain on the warpath. Politicians who in their own parliaments vote for a new battleship without a blush are querying at Geneva the cost of repairs to a chimney flue or the family allowance of a clerk. To judge from some expressions of imperial opinion at the present Assembly, the most magnificent contribution which the League could make towards peace would be to reduce its annual expenditure on that object. International good will, apparently, is worthy of lip service, but not of any odd change that happens to be in the pocket. The actual figures ought to be stated as baldly as possible. The total expenditure of the League as estimated for 1935 is, roughly, 30 million Swiss francs, or, at the present low value of the pound, £2,000,000 sterling, and of this amount the United Kingdom pays one-ninth. All the fuss and fury of a certain section of English opinion over the extravagance of Geneva concerns a matter of a quarter of a million pounds, or an annual tax of something like one penny farthing on each British citizen. Taking the International Health Organization alone, which is a field where the League might expect to have no critics, except those who urge it on to bigger endeavour, the total expenditure for

1934 was 1,650,000 Swiss francs, and for 1935 the estimate is 1,185,000, the chief savings being on the work of the technical committees, the experts, the collective and individual studies, and the contribution to the Singapore bureau. The amount mentioned includes grants from the Rockefeller Foundation, with the result that the net expenditure chargeable to the League for international health work for 1935 is only some 800,000 Swiss francs, or about £50,000, of which the British contribution is equal to the salary of a Cabinet Minister. For this modest sum many expert inquiries are set on foot, a service of epidemiological intelligence is undertaken, missions to parts of the world where public health is backward are conducted, and the system of liaison between the various health services is maintained. The Rockefeller Foundation provides the salary of the chief of the epidemiological service and of fourteen other officials. It is certainly a little depressing to hear the Secretary-General declare apologetically that since 1932 the budget for these and other League services has been progressively reduced, and still more melancholy to find the delegates, instead of rising up in wrath, accepting the fact complacently as a tribute to the business acumen of themselves and their predecessors.

A METABOLIC EXERCISE TOLERANCE TEST

S. Soskin, L. N. Katz, *et al*[1] describe a simplified method of determining the excess oxygen consumption during exercise and the time required for recovery by the metabolic exercise tolerance test. It permits a visual check on the steady state of the patient before the exercise, and his return to the resting level after it. The simplified method is hardly more difficult to perform than the ordinary basal metabolism test when the equipment has been assembled, and in this form it is suitable for routine use in the clinical laboratory. The objective nature of the test, eliminating the subjective influences of both patient and physician, renders it suitable for comparative work by different groups of observers, and applicable to the classification of cardiac disability for insurance purposes. In a second contribution[2] the authors record the results of applying this test to a group of patients with cardiac disease. It was found that the measurements, particularly of the excess oxygen consumption during exercise, were greater than normal in patients with organic heart disease and with a history of some limitation of activity, even when no congestive heart failure was present. When these patients were classified into subgroups according to the history of the degree of limitation of activity, the measurements became progressively greater as one passed from the group with no limitation of activity to the group with marked limitation. It is concluded, therefore, that this test, which yields an objective quantitative estimation of the cardiac capacity of a patient at the time of examination, merits further consideration as an adjunct in the study of cardiac disease, and affords material for determining prognosis and treatment. A series of tests is in progress on patients developing and recovering from congestive heart failure, and on patients with reactivation of rheumatic infection, in order to correlate more closely the results of the test with the condition of the patient at the time of the test. The investigations have already made it clear that both healthy and diseased patients show a considerable variability in their response to the test in short periods of time, but that such variability has well-defined limits in each case. It is suggested that such individual variations have been overlooked in previous estimations of capacity, and that this accounts for discrepancies in reports by different series of investigators.

[1] *Arch. Int. Med.*, May, 1934, p. 706.
[2] Ibid., p. 710.

CASE MORTALITY OF DIPHTHERIA

It is well known that the case mortality of diphtheria in some areas has risen in late years, and the full explanation is not obvious. D. T. Robinson and F. N. Marshall,[1] in Manchester, have inquired whether the "gravis" and "intermediate" types of diphtheria bacilli cause an unduly high death rate. They found no difficulty in dividing four to five hundred strains into the gravis, intermediate, and mitis groups of J. S. Anderson[2] and co-workers, though, like some other pathologists, they found variations within the groups. Thus only two-thirds of 127 gravis strains were non-haemolytic, and one-quarter failed to produce the typical early alkaline reversal in broth. By agglutination, Miss Ewing[3] could define several starch-fermenting types, none of the types appearing among fifty non-fermenting strains. The dangerous infections with gravis and intermediate strains were found in about 78 per cent. of Manchester patients with death rates of 14 and 16 per cent., while the mitis, present in about one-sixth of the infections, caused a death rate of only 3 per cent. McLeod's collected figures from 2,000 cases show corresponding death rates of 14, 10, and 3 per cent., while Mair and Joe[4] in 152 London cases found death rates of 11, 8, and 6. Evidence is therefore accumulating in support of McLeod's hypothesis that "mitis" does cause a "milder" infection, at least in the districts from which he gathered strains. It seems that the prevalence of types is changing in places, for Dudley and Parish meet with typical starch-fermenting (gravis) strains more often now in London patients than a few years ago, and of sixty strains tested about 1923[5] only two fermented starch. Robinson and Marshall think that ordinary antitoxin is more effective against mitis infections: about 70 per cent. of the deaths in the gravis group occurred in patients treated within three to four days of infection. Not all writers would agree with these workers in calling this "early" serum therapy, for, while Cobbett[6] in an analysis of some 4,000 cases collected over many years found a case mortality of *nil* among persons treated on the first day, the figure for the third day was 11, and for the fourth 17—figures not widely different from those found by the Leeds workers. Parish, Whatley, and O'Brien[7] injected large amounts of toxin or culture of gravis and mitis strains into guinea-pigs and gave ordinary antitoxin at intervals thereafter. Antitoxin given two hours after infection saved all animals; after eight hours it saved none. In the intervening periods there was no signi-

[1] Robinson, D. T., and Marshall, F. N.: *Journ. Path. and Bact.*, 1934, xxxviii, 73.
[2] Anderson, J. S., Happold, F. C., McLeod, J. W., and Thomson, J. G.: Ibid., 1931, xxxiv, 667.
[3] Ewing, J.: Ibid., 1933, xxxvii, 345.
[4] Mair, W., and Joe, A. E.: *Lancet*, 1934, i, 299.
[5] "Diphtheria," Medical Research Council, 1923, No. 418.
[6] Cobbett, L.: *British Medical Journal*, 1933, ii, 139.
[7] Parish, H. J., Whatley, E. E., and O'Brien, R. A.: *Journ. Path. and Bact.*, 1932, xxxv, 653.

ficant difference between the percentages saved in the gravis and the mitis groups of animals. Long clinical experience strongly indicates that all diphtheria infections are fundamentally similar, for there is apparently no instance on record in any part of the world in which prophylactic doses of ordinary antitoxin have failed to give complete and immediate protection. A further attempt to explain the high death rates recently recorded led to the suggestion that sera of low "avidity"—that is, low readiness to combine with and neutralize toxin—may be at fault. W. Kolle and R. Prigge[8] have recently examined the point and give no support to this view: they stress the effectiveness of serum in the early stages of infection. Robinson and Marshall suggest that the ordinary Schick-negative level of immunity affords complete protection against the attack of mitis strains, but not always against gravis or intermediate strains, for they record one severe and three moderately severe infections in children with a "Schick-negative" reaction; presumably the level of antitoxin in the blood of the patients was not determined. Parish (loc. cit.) found that three-score Schick-negative guinea-pigs suffered no harm from the injection of lethal doses of a number of different strains of gravis. Robinson and Marshall inquired whether the infection of the organs and heart blood after death could be detected less commonly in animals injected with mitis strains: mitis was found in pleural fluid or heart blood in about 25 per cent., while the other two types were found approximately twice as often. No observations of the kind relating to human subjects appear to have been made. The average reader, after reflecting on all this puzzling evidence, will again ask how it comes about that, despite the high hopes that insurance practice would offer great opportunity for improvement in early diagnosis and treatment, so many unfortunate children are submitted for serum treatment three, four, or more days after the beginning of the attack. Can our magnificent health organization do nothing by popular education of patients, and by appeals to doctors, to end this reproach?

OPIUM AND THE LEAGUE OF NATIONS: A NEW SOURCE OF MORPHINE

The last report of the Advisory Committee on Traffic in Opium and Other Dangerous Drugs presented to the Council of the League of Nations surveys the present position of the problem as regards both licit and illicit traffic in narcotics. The committee has been strengthened by the addition of representatives of Canada, Persia, Sweden, and Turkey to its membership; Mr. L. A. Lyall, chairman of the Central Opium Board, has been reappointed as assessor, along with M. de Myttenaere, a Belgian pharmacologist of repute. Shrinkage of the licit commerce, under international conventions, and the serious increase of illicit production and traffic in China and Manchuria, as well as in Bulgaria, are the notable features of the committee's survey. While the average annual production of raw opium in the world, apart from China, is stated to be 1,770 tons, the total production in China in 1930 was estimated to be 12,000 tons, or seven times that of the rest of the world. In Bulgaria, according to the Canadian representative, the production of raw opium is reported to have increased from 4,000 kilos in 1932 to 65,000 kilos in 1934. From the quantities of acetic anhydride imported into Bulgaria, presumably for the manufacture of heroin, it was estimated by the American representative that some 3,000 to 6,000 kilos of this alkaloid were produced in clandestine Bulgarian factories in 1933, or from two to four times the legitimate heroin requirements of the whole world. In Manchuria the introduction of a monopoly system has proved unsatisfactory. In the northern part of the country the production of opium has got out of Government control. It is estimated that no less than 30 per cent. of the population of Manchuria are addicts, while opium shops and smoking establishments abound. A novel and disturbing element in the opium problem is the discovery, made by a Hungarian chemist, that morphine can be manufactured from the dry parts of the poppy plant (straw and chaff) remaining after the ripe capsules have been extracted. These parts have hitherto been treated as useless refuse, and either destroyed or used as manure. The new process has been exploited by the Alkaloida Co., Ltd., in which the Hungarian Government has a controlling interest. There are some 8,000 hectares of land under poppy cultivation in Hungary, and the produce of this poppy straw is estimated at about 13,000 tons in a year. From a ton of poppy straw some 800 grams of morphine base and 80 grams of codeine base can be obtained; it is estimated that this year about 480 kilos of morphine will be thus produced. The Advisory Committee is concerned at the effect which this new source of opium alkaloids may have on the world market; it instructed the secretariat to study the legal and practical aspects of the utilation of this new raw material, and resolved to go more fully into the whole question at its next session.

[8] Kolle, W., and Prigge, R.: *Med. Klinik*, 1934, p. 258.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS

We publish in the *Supplement* this week, at the request of the Registrar of the General Medical Council, a list of the names of those medical practitioners who have not replied to his inquiries as to the accuracy of their postal addresses. Any practitioner, wherever resident, whose name is included in this list should communicate at once with the Registrar of the General Medical Council, 44, Hallam Street, Portland Place, London, W.1, or, in certain specified cases, with the Registrar of the Scottish Branch Council, 12, Queen Street, Edinburgh, 2.

On November 25th, 1884, the first operation for the removal of a cerebral tumour was performed in the Hospital for Epilepsy and Paralysis (then in Portland Terrace, Regent's Park) by Mr. Rickman John Godlee, afterwards Sir Rickman Godlee, Bt., P.R.C.S. It is proposed to celebrate this jubilee by a paper to be read by Mr. Wilfred Trotter, F.R.S., at the Royal Society of Medicine, and by a commemoration dinner.

By an Order of the Committee of Privy Council the Marquess of Linlithgow is appointed a member of the Medical Research Council on the retirement of Viscount D'Abernon, whom he will succeed as chairman.

THE BRITISH PHARMACEUTICAL CODEX

A SURVEY OF MATERIA MEDICA

We welcome the publication to-day of the fourth edition of the *British Pharmaceutical Codex*.[1] This is one of the most useful reference books available to the medical profession, and our gratitude is due to the Codex Committee of the Pharmaceutical Society for providing an authoritative account of the majority of the drugs used in medicine. Eleven years have passed since the last edition appeared, and the dates of the three previous issues are 1907, 1911, and 1923. Inspection of the volume will explain these relatively long intervals: it is a work whose revision must entail an enormous amount of labour. A comparison of the new edition with that of 1923 shows that the size, form, and general arrangement of the book have not changed greatly, but on closer examination it is evident that the material has been almost wholly rewritten. A large amount of new information has been introduced, and the size has been kept constant by a careful editing of the old material. The scope of the revision can be indicated by the analysis of a typical section—namely, the monographs on sodium salts: in the last edition there were forty-three of these monographs and they occupied forty-four pages, while in the new edition there are thirty-six monographs, which occupy forty-one pages. These figures do not, however, indicate the amount of change, since thirteen of the old monographs have been discarded and six new ones introduced. Moreover, the monographs retained have been rewritten.

The first essential for a work of reference is that it should be up to date, and the new *B.P.C.* is completely satisfactory in this respect. For example, monographs on the following subjects are included: solution of vitamin A, vitamin B concentrates, vitamin C concentrates, cortin, corpus luteum, oestrin, parathyroid extract, and extract of the anterior lobe of the pituitary.

STANDARDS FOR NON-OFFICIAL MEDICAMENTS

The extensive revision the *Codex* has undergone has been accompanied by a certain change in the character of the book. The original purpose of the *Codex* was to provide information concerning all drugs and medicines in common use throughout the British Empire, and to serve as an imperial dispensatory for medical practitioners and pharmacists. Experience has shown, however, the urgent need for authoritative standards for the composition of medicaments which are not included in the *British Pharmacopoeia*, and the new volume devotes a large amount of space to the provision of such standards. In the case of substances included in the *Pharmacopoeia* a brief reference is made to the standards there laid down, but in other cases standards have been devised where this is possible. The provision of standards for a wide range of drugs that are outside the *Pharmacopoeia* is an important public service. The editors explain in the preface that whereas the Food and Drugs Act requires a drug to be of the nature, substance, and quality demanded by the purchaser, yet no legal standards have ever been provided. In practice the courts have used the *British Pharmacopoeia* as a presumptive legal standard, but there has been a need for standards for drugs not included in the *Pharmacopoeia*, and these are provided by the new edition of the *Codex*. The setting up of these standards has raised certain interesting problems; thus the editors have worked out a new and ingenious method for the quantitative measurement of the number of foreign particles present in powdered vegetable drugs.

A new feature of the *Codex* is a short but important section providing standards for surgical dressings. For example, it states limits for the amounts of medicament that should be contained in such preparations as mercury and zinc cyanide gauze, iodoform gauze, boric lint, capsicum wool, zinc oxide plaster, etc. The importance of having some uniform standard for such substances is obvious.

This provision of standards is one of the most important functions of the *Codex* so far as pharmacists and chemical manufacturers are concerned, while from the point of view of the medical profession the special value of the *Codex* is that it furnishes information about a much wider range of drugs than those included in the *Pharmacopoeia*. The difference in scope of the two volumes can be illustrated by a simple example. The titles of four successive monographs in the *Codex* are hexamine, hexyl-resorcinol, hirudo, and holarrhena. Hexamine is in both the *Pharmacopoeia* and the *Codex*, hexyl-resorcinol is a synthetic drug which has not been admitted to the *Pharmacopoeia*, hirudo (the leech) disappeared from the last edition of the *Pharmacopoeia*, whilst holarrhena is an old-standing Indian remedy for dysentery which has never been included in the *Pharmacopoeia*.

PHARMACOLOGICAL AND THERAPEUTIC ACTIONS

Another important difference between the *Pharmacopoeia* and the *Codex* is that the former confines itself to laying down standards for drugs, whereas the *Codex* in addition gives information about their pharmacological and therapeutic actions. This feature makes the *Codex* very valuable to medical practitioners, but it has involved the editors in the difficult task of reconciling therapeutic customs with known scientific facts. The compromise adopted has been to list the preparations actually in frequent use, and at the same time to indicate their probable value. For example, eight preparations of dilute hypophosphorous acid are described, whilst under the heading "Actions and Uses" is the simple statement: "There is no pharmacological evidence that they (hypophosphites) behave differently from other inorganic salts, and any benefit derived is ascribed to the iron or calcium with which the acid may be combined." Similarly, two varieties of parathyroid tablets are described, but the reader is warned that this preparation is of little value when taken by mouth. There are also monographs on eight lithium salts, but in each case it is pointed out that the action is essentially the same as that of sodium or potassium salts. The attitude adopted seems a reasonable compromise, but it is important to realize that the *Codex* simply describes what the medical profession prescribes, and does not reject any substance in common use merely because there is no rational foundation for such usage.

A THOUSAND STANDARD PRESCRIPTIONS

The monographs on drugs and on dressings occupy two-thirds of the volume, while the formulary occupies more than half of the remainder. This formulary contains about 1,000 standard prescriptions. Not only is the prescription given, but, where necessary, notes on dispensing are added, and in all cases standards for the resulting mixture are given. In this section regard is paid to elegance rather than to economy. Prescriptions with more than twelve ingredients are not uncommon, and a link with the past is preserved by the inclusion of the antiperiodic tincture, which, with its nineteen ingredients, is a lineal descendant of the theriacs or treacles of the Middle Ages. The insurance practitioner who followed these models would, however, probably get into difficulties with the local Panel Committee, and it seems a pity that simpler if less interesting prescriptions have not been included. For example, a formula that will provide a satisfactory emulsion of liquid paraffin and agar is often required, but the one included in the *Codex* contains nine ingredients, and it seems probable that a simpler formula could be devised. The *Codex* would certainly perform a useful service if, in addition to the elegant formulae set out, which often contain half a dozen different flavouring agents, the editors would also give a parallel series of utilitarian formulae.

AN INDEX OF PROPRIETARY NAMES

The volume closes with a series of appendices, most of which are concerned with physical and chemical measurements and chemical tests. The appendix headed "Pharmacological Index" might with advantage have been revised somewhat more rigorously. For example,

[1] *The British Pharmaceutical Codex, 1934.* Fourth edition. London: The Pharmaceutical Press. 1934. (Pp. 1,768. 35s. net, inland postage 1s.)

the list of nerve tonics opens with formic acid, glycerophosphates, and hypophosphites, whereas the monographs on these substances point out that there is no reliable evidence that they have any such action.

The final appendix gives a list of some 800 proprietary trade names of medicinal substances. The editors point out that it has only been possible to include a small fraction of the branded products that are on the market, but inspection shows that most of the best-known substances have been included. Secret remedies naturally do not appear. The list contains two chief classes of names: first, proprietary names of well-known official drugs such as acetyl-salicylic acid, procaine, barbitone, etc., and secondly, important new drugs that are only sold under their proprietary names—for example, plasmoquine, nupercaine, nembutal, evipan, etc.

An index of this kind was introduced into the last edition of the *Codex*, but was then much smaller. The great increase in the size of the index is an indication of the increasing importance in therapeutics of drugs sold under proprietary names. This index is a feature of the *Codex* that will be found of great value by the medical profession, since it provides an easy means of discovering whether some new and unfamiliar name represents a possible therapeutic advance or merely refers to a special brand of some well-known drug.

It is difficult to do justice to a work of reference of this kind in a short review, since the utility of such a volume depends so much on its detailed accuracy. Perusal of the *British Pharmaceutical Codex, 1934*, shows, however, that every effort has been made to bring it completely up to date, and that it represents the skilful accumulation of a vast amount of information of importance alike to the pharmaceutical and to the medical professions.

Ireland

Local Government and Health Legislation

The text of the Local Government Amendment Bill (Irish Free State) (No. 2), which was recently introduced in the Dail, has been published. Until the Bill is discussed it is not quite clear how far it may go. It would appear, however, that it provides, in certain circumstances, for the abolition of the county health boards. This would mean the transfer of medical and other officials to the county councils, and, in some instances, the discontinuance of existing officers. The Bill provides that on the request at any time, whether before or after the passing of the Bill, of a county council the Minister for Local Government and Public Health may make a dividing order: (*a*) declaring that there shall be as from the commencement of the order a specified number (not less than two) of rural sanitary authorities in such county; (*b*) specifying the portion of the county which is to be included in and is to constitute such rural sanitary district, and so far as may be requisite, defining the boundaries of each sanitary district; and (*c*) selecting a day, not less than three months after the date of the order, to be the appointed one for the purpose of the order. The Minister may also, on the request of the council, alter in such manner as shall be specified in the request the numbers of the council. An order made by the Minister shall, without any confirmation from the Oireachtas, come into operation and have effect on and after the first triennial election of members of the council held after the appointed day. When the Minister has made a dividing order, and either or both of the following circumstances exist, he shall make a new division of the county into county electoral areas, and shall so make such divisions that every electoral area is wholly within one or other of the new rural sanitary districts: (*a*) one or more of the county electoral areas is, at the date of the order, situate partly in another or others of the new rural sanitary districts; and (*b*) the Minister has altered the number of members of the county council. Wherever the Minister has made a dividing order the following provisions shall, on and from the appointed day, have effect: (*a*) the area of the county, which at the date of the order is a rural sanitary district, shall cease to be a rural sanitary district; (*b*) there shall be constituted in the county the number of rural sanitary districts specified in the order, and each rural sanitary district shall contain that portion of the county specified in the order; (*c*) the council of the county shall be the sanitary authority for each of the rural districts so considered; (*d*) each of the rural districts shall be a county health district within the meaning of the principal Act, and shall be called by the name of the "County Health District of . . ." with the addition of the name of the county and such distinguishing name as the Minister shall direct; (*e*) subject to the provisions of this Act the principal Acts shall apply and have effect in and relative to every rural sanitary district and county health district, as if such district had been constituted by an order made under Subsection (2) of Section 9 of the Act of 1925; (*f*) if there is a board of public health in and for the county at the date of the order the board shall be dissolved and cease to exist; (*g*) a scheme shall be prepared and submitted to the Minister for Local Government and Public Health providing for the continuance or discontinuance of the officers of existing boards. The scheme shall provide: (*a*) for the continuance of an officer in the service of the board of health of one of the new districts, either in the office he held before or in an analogous office with analogous duties; or (*b*) for his appointment, according to law and with his consent, to an office in the service of the board of health of a new district; or (*c*) for his removal from office. Every dispute as to whether an office is analogous to another, or the duties are analogous to those of another office, or the whole of an officer's time is occupied shall be determined by the Minister, whose decision shall be final.

Criticisms of the Clean Milk Bill

The Department of Local Government and Public Health, in reply to criticisms by Dr. J. C. Saunders, Cork county borough medical officer of health, of the Clean Milk Bill, 1934, has issued a memorandum stating that the object of the Bill is to supplement the legislative powers already in existence for safeguarding milk intended for human consumption, so as to enable the recommendations of the Inter-Departmental Committee on the Milk Supply to be carried into effect, in so far as these recommendations are deemed practicable and desirable. In considering the new powers to be acquired it is necessary in the first instance to review the existing statutory provisions dealing with the supervision of the milk supply. These provisions are mainly contained in Section 34 of the Contagious Diseases (Animals) Act, 1878, and empower the Minister for Local Government and Public Health to make orders in regard to: (*a*) the registration with local authorities of all persons carrying on the trade of cowkeepers, dairymen, or purveyors of milk; (*b*) the inspection of cattle in dairies and the regulation of lighting, ventilation, cleansing, drainage, and water supply of dairies and cowsheds; (*c*) the cleanliness of milk stores, milkshops, and of milk vessels; (*d*) the precautions to be taken for protecting milk against infection or contamination; and (*e*) the authorization of local authorities to make regulations concerning the foregoing. The objections of Dr. Saunders to the Milk Bill, as set out in his general commentary, were as follows: (1) the difficulty of obtaining convictions for the sale of dirty milk in the absence of a specific definition of dirty milk; (2) the omission of clauses dealing with the fre

quent veterinary inspection of cows, and measures for the eradication of tuberculous cattle; (3) absence of provisions requiring all milk vendors to be licensed; (4) non-recognition of power of extra-territorial inspection of cattle and premises from which milk is supplied in an urban district; and (5) precautions not yet prescribed in regard to the bottling of milk. He recommended that dairy employees committing offences under the Dairy Regulations should be rendered liable to penalty in lieu of the employers. The Department has dealt with Dr. Saunders's objections as follows: (1) As regards the necessity of defining dirty milk, this term is included in the Dairy Produce Act, 1924, which prohibits the supply of dirty milk or cream to a creamery, and it is understood that no difficulty has arisen in securing convictions under that clause. (2) The problem of the eradication of tuberculous cattle is being considered in all its aspects by the Minister for Agriculture, and is expected to be dealt with shortly. (3) Having regard to the proposed licensing under the Act of all milk vendors selling milk of special designations, including pasteurized milk, it has been deemed sufficient to rely on the powers set forth above under Section 34 of the Contagious Diseases (Animals) Act, for the registration of persons carrying on the trade of cowkeepers, dairymen, or purveyors of milk. (4) The Minister is already empowered under Section 19 of the Tuberculosis Provisions (Ireland) Act, 1908, to authorize an urban district council to arrange for the inspection of dairies outside its district from which the local milk supply is delivered. (5) Under Clause (*d*) Section 34 of the Contagious Diseases (Animals) Act, 1878, the necessary power for the regulation of milk bottling is available, and will be exercised on the revision of Dairies, Cowsheds, and Milkshops (Ireland) Order of 1908. It is also intended, in connexion with the revision of these regulations, to provide for the penalizing of dairy employees committing offences against the regulations.

The Dufferin and Ava Hospital, Belfast

At a recent meeting of the Belfast Board of Guardians the annual report of Dr. S. R. Armstrong, visiting medical officer, was received. The report stated that 325 mothers and 691 infants had been admitted during the year. The death rate amongst the infants was 17 per cent. A great benefit had been bestowed upon all the patients in the Ava Hospital by the general excellence of the arrangements and appointments. The wards were bright, cheerful, and well ventilated. There was an easy access to beautiful balconies, which were sheltered and sunlit all day. The visiting medical officer referred to some of the difficulties which mitigated against a greater success, although their statistics compared very favourably with those of any other hospital. One difficulty was the large number of infants admitted too late in their illness or so hopelessly ill that it was almost impossible to do anything to save their lives. Fourteen infants died within a period measurable by hours from the time of their admission. A second difficulty was that a hospital such as theirs admitted a large number of infants who could not be discharged, as they were from voluntary hospitals, and when they recovered from the acute conditions and were convalescent, required further careful nursing by a mother, and segregation from all other acutely ill infants. Dr. Armstrong's report went on to state that it was obvious that they could not discharge infants who were convalescent but grossly under weight, because an outcry from some quarter would immediately be heard. Yet this was unquestionably the correct procedure. Such infants should be removed from hospital, where the possibilities of fresh contagion so palpably existed. An essential for such infants was the fondling and mothering and individual attention which every baby had, even in the poorest of proper homes. A further difficulty which only came into prominence when one had to compare statistics with voluntary hospitals was that they must necessarily admit cases which would not be admitted to the latter hospitals. These were the incurable, and he referred especially to infants newly born with gross skeletal defects of the spine, skull, palate, etc., which could not be remedied by operation. From such defects during the past year they had had eight deaths. A solution of some of their difficulties was obvious even before the Ava Hospital plans were completed, but he hesitated to suggest the large expenditure which inclusion in the new building of an infant convalescent department would have necessitated. The report was adopted.

Royal Academy of Medicine in Ireland

At a meeting of the General Council, held in Dublin at the Royal College of Physicians of Ireland on September 21st, the following candidates were duly elected Fellows of the Royal Academy of Medicine in Ireland: James Bell, D.Sc., E. J. Conway, D.Sc., M.B., T. J. O'Connell, M.B., Harry Lee Parker, M.B., J. A. Wallace, M.B.

England and Wales

L.C.C. Lewisham Hospital Extension

Lord Dawson of Penn will open an extension of the London County Council's Lewisham Hospital on Tuesday, October 9th. The extension includes a maternity department, a children's section, and two general wards. The maternity department is situated on the upper and part of the middle floor of the three-storied block, and provides accommodation for sixty-three mothers and forty-five infants. The principle of the small ward has been followed and there is ample provision of single-bedded wards. There are five labour rooms grouped together on the top floor in a projecting wing and thus isolated from the wards. A sterilizing room, sink room, bathrooms for adults and infants, and a premature babies' room with special heating are placed in convenient proximity. The children's section contains thirty-five cots; there are three wards, of which the largest contains twelve cots, and six isolation cubicles. The two general wards with their associated small wards contain sixty-six beds, and the total additional accommodation provided in the extension is 164 beds, which brings the number of beds in the hospital to 747.

Child Welfare in Birmingham

In his annual report for 1933 Dr. H. P. Newsholme, medical officer of health for the city, points out that a most encouraging indication of the improving health in the younger generation is afforded by the steady and marked decrease which is still discernible in the death rate in early childhood. This rate for the age period 1 to 2 years fell from 45.9 per 1,000 in 1912–15 to 14.3 in the years 1931–3, and the corresponding rate for those aged 2 to 5 fell from 12.2 in the first-year period to 3.9 in the second. He remarks that such a fall, accomplished by successive regular steps during successive periods, is obviously not fortuitous, but is a sign that the general and the specific measures of public health, whether of the maternity and child welfare or of other cognate services affecting the young child, are bearing fruit in the most obvious manner. The birth rate continues to fall in the centre and the middle rings of the city. The death rate in the centre wards is still higher than in the outer

wards, a fact probably associated with such environmental factors as overcrowding, less efficient maternal care, and nutritional difficulties associated with poverty. It is largely due to preventable disease. The continued high neo-natal mortality is preventing a further fall in the infant mortality rate. There is, however, a progressive, though small, improvement, possibly related to the better care which is now taken of feeble infants. The loss of life from stillbirths is unabated, and the number of these is actually higher than that of the neo-natal deaths. While a proportion of these must remain inevitable, being associated with gross congenital malformations, it would appear to be deducible that ante-natal care has not yet reached the root of the problem in its extent or its character. In the age group 1 to 5 years pneumonia is the more frequent cause of death, enteritis being relatively unimportant. Statistics indicate that at the beginning of its life a baby runs little more risk of death if living in the central wards of the city than in the outer ring, but between the third and sixth months the effects of a bad environment become increasingly apparent, until, at the age period 9 to 12 months, the mortality is twice as high in the central as in the outer wards. The city council now maintains twenty-eight child welfare centres, and two subsidiary ones. An attendance at these centres of 71 per cent. of the infants born during the year is very satisfactory, and is higher than in previous years. The number of older children attending has also increased. Special efforts have been made to teach housewifery and family budgeting to the younger women. In some areas the fathers have shown special interest in the work of the centres, and fathers' councils or parents' leagues have been formed. Dr. Newsholme suggests that the general standard of ante-natal care at the child welfare centres could be definitely improved by greater co-operation between medical practitioners, institutions, midwives, and patients, but more research is needed for abnormal cases. Many women also fail to come early enough in pregnancy to gain the full advantage of the present state of knowledge. The public health committee has provided ten ante-natal beds in each of the two city maternity homes. Dr. Newsholme emphasizes the importance of rest in the case of postural defects, since most of the children coming to the remedial exercise clinic are suffering from too little rest. Mothers in most cases do not recognize the need of a daily rest for children between the ages of 3 and 5. The experience of this clinic indicates that improvement cannot be expected quickly, but, given sufficient time and conscientiousness on the part of the parents at home, the results are gratifying.

Scotland

Royal Samaritan Hospital, Glasgow

A medical report is published annually by the Royal Samaritan Hospital for Women, Glasgow, containing details of the work and statistical information. In the issue for 1933 it is recorded that during that year the total number of patients dealt with was 2,962; there were 2,638 operations, and the mortality was 1.32 per cent. A list is given of the aetiological factors involved in the production of the pathological lesions encountered. Injury associated with child-bearing was noted in 1,214 cases, and infection so associated in 578. Infection not associated with childbirth was responsible in 369 cases. The figure for new growths was 481, and for errors of development 188. A detailed analysis of the pathological lesions in tabular form shows the average age of the patients in each group, and their relation to such conditions as parity, the number of years since the last pregnancy, if any, the average number of children and miscarriages, and the incidence of operative intervention. Matter of considerable scientific value is thus published. Two new tables appear in the 1933 issue, under the headings respectively of "Symptoms" and "Surgical Procedures." They have been added to convey an idea of the frequency of the different complaints made by patients coming to the institution, and the number of occasions on which various surgical procedures were performed in the course of a single year. From this it appears that the two most common causes bringing patients to the hospital were haemorrhage and bearing-down sensations, each accounting for about 14 per cent. of the whole. Pain on the left side of the abdomen was a primary manifestation in 10 per cent., on the right side in 6.2 per cent., and on the mid-line or bilateral in 5.2 per cent. Pain in the back alone was the cause in 6.6 per cent., while back pain associated with pain in the lower abdomen was noted in 2.9 per cent., most commonly on the left side. Vaginal discharge was similarly concerned in 8.3 per cent., sterility in 5, excessive menstrual bleeding in 5.1, bladder symptoms in 4.3, and symptoms referable to the rectum in 2 per cent. Dilatation of the cervix and curetting of the uterus were performed on 1,119 occasions, trachelorrhaphy on 500, colpo-perineorrhaphy on 338, subtotal hysterectomy on 256, anteversion of the uterus by shortening the round ligaments (various methods) on 218, and tubal insufflation on 205. A brief summary of each of the thirty-nine fatal cases is appended.

Hospital Problems in Dundee

Hospital policy is discussed in some detail in the annual report for 1933 of the public health department of the City of Dundee. Dr. W. L. Burgess, medical officer of health, states in this connexion that the attention of the City Council during the year was mainly directed to reorganizing the various institutions under their own management, the stage not having yet been reached when complete co-operation with the University and with other hospitals would be possible. He attacks the tendency to emphasize unduly the "hospital services" or the "hospital scheme" as though such services or schemes fell outside the general health movement; the effect, he thinks, might easily be that the hospitals would tend to become a separate service not properly linked up with the other medical and allied services. Even in a general health scheme, he adds, it would be perfectly possible for these institutions to retain their voluntary status, character, and traditions. At present there is believed to be a shortage of hospital beds, and the natural tendency is to aim at providing more, but it is essential to be certain first that the available beds are being used to their best advantage. This matter has been carefully considered by the Dundee Council, which has satisfied itself that by administering Maryfield Hospital under the Local Government (Scotland) Act of 1929 instead of under the Poor Law (Scotland) Act of 1845 better use could be made of the beds in that institution. Accordingly, its services are now no longer restricted to persons whose names are on the poor roll, but have been made available for the general public. Whereas formerly at certain seasons the hospital was not in full use, because it was open to only one section of the public, the beds are now being fully utilized all the year round, and thus without the addition of a single bed the hospital accommodation available to the general community has been definitely increased. Again, a vigorous campaign against slums is now in operation and, if brought to a successful issue, will probably permit domiciliary treatment for many who under the present

conditions would have to be dealt with in hospital beds. An extension of the facilities for home nursing might also have a very definite influence on the demand for hospital treatment, and Dr. Burgess is convinced that the expansion of the national health insurance scheme to cover wives, dependants, and all persons in similar circumstances would render the present hospital problem very much less formidable. If medical attention became more easily available, earlier treatment would prevent many cases from reaching the hospital stage. A larger number of patients could be treated at home if certain additional facilities in respect of diagnosis and treatment were placed at the disposal of general practitioners, or at any rate the average stay in hospital could be appreciably shortened. Such facilities might include laboratory assistance, consultations with specialists, and *x*-ray reports. Until the report is published of the Departmental Committee which is at present considering the whole question of the health services in Scotland, Dr. Burgess thinks it wise to proceed cautiously so as not to prejudice future action.

CORRESPONDENCE

Increased Mortality from Diabetes

SIR,—The interesting letter from Dr. Alex. Fraser (September 22nd, p. 570) affords a possible explanation for a statement recently repeated that the mortality from diabetes has increased since the introduction of treatment by insulin. This statement, to anyone familiar with the treatment of diabetes during the past thirty years, is so astounding as to be incredible. We know that before the introduction of insulin there were really no known cases of recovery from diabetic coma ; I can recall two or three instances in the literature and, to the best of my recollection, they were but temporary recoveries followed by death after a very brief period. To-day recovery from diabetic coma is the rule rather than the exception, and there must be many of us who have seen it occur in over a hundred cases. It is perfectly true that we sometimes encounter a case in which coma is already so deep that we fail to save life ; it is also true that the careless diabetic patient may have further attacks of coma months or years after discharge from hospital—instances of restoration from coma five or even ten times in the same patient are not difficult to collect. But how is it possible in the face of this one fact, the modern treatment of coma, to suggest that the mortality from diabetes has increased?

The explanation, as Dr. Fraser suggests, lies probably in faulty statistical analysis. Prolonged experience with a diabetic clinic soon establishes the fact that diabetic patients fall into two main groups: (*a*) children and young adults with severe diabetes, and (*b*) elderly people with diabetes of milder degree but commonly associated with arterial disease. The former group call for the greater skill on the part of the physician as regards diet and treatment with insulin, but given a reasonable degree of technical competence the results are almost uniformly good, and the prognosis equally so. The latter group frequently require little treatment as far as the diabetes is concerned, but have a prognosis which is chiefly governed by the concurrent arterial disease ; it is an everyday experience to see such patients, in whom the diabetes has been effectively controlled for several years, succumb to such diseases as cerebral haemorrhage, cardiac failure, or gangrene secondary to arteritis. It seems very probable that the frequent inclusion of the word " diabetes " on the death certificates of this latter group accounts for the myth that diabetes itself treated on modern lines affords a bad prognosis.—I am, etc.,

London, W.1, Sept. 22nd. T. IZOD BENNETT.

Preliminary Ligation in Graves's Disease

SIR,—Since last June there has been an interesting exchange of views in the various numbers of the *British Medical Journal* on the subject of preliminary ligation. It is surprising to find the expression of so many diverse opinions. About twelve years ago the pre-operative treatment of Graves's disease was placed upon a firm scientific basis. Since that time the indications for preliminary arterial ligature are few and far between.

It is true, but not universally true, that the patients who derive greatest benefit from ligation belong to precisely the same group as those who respond readily to the administration of iodine. Conversely, if iodine fails it is reasonable to assume that ligation will prove a disappointment. Dogmatism is, however, to be avoided in this as in most other surgical considerations.

After a long experience in an area in which Graves's disease was not uncommon, I have been guided by certain beliefs.

1. In the case of the really bad surgical risk in which adequate and prolonged pre-operative preparation is of no avail, ligation is indicated. The second or third shot sometimes hits the target and the prognosis may become completely changed. Thus ligations, although rarely indicated, may convert a bad surgical risk into a case safe for thyroidectomy when other weapons have failed.

2. A severe reaction sometimes follows ligation or any other procedure. Such a reaction indicates the intolerant condition of the patient, and is a warning to proceed with caution by carefully graded operative measures.

3. In the event of a fatal result following ligation in the serious type of case under review surgery is blameless.

4. It is important to ligate the trunk of the superior thyroid artery after clear exposure. The anterior branch is sometimes mistaken for the main vessel. Additional ligature of both anterior and posterior branches inhibits the collateral circulation from below. Personally I avoid thyroidectomy in a case of uncontrolled hyperthyroidism without a preliminary attempt to obtain control by ligations. We must recognize, however, that the personal factor is of importance.

Each surgeon will obtain the best results by following the path with which he is most familiar, but familiarity with thyroidectomy does not necessarily imply familiarity with the ligature of the isolated thyroid trunk. I have seen Kocher, Mayo, Crile, and many others at home and abroad, including some of your correspondents, operate on cases of severe hyperthyroidism. As a spectator one instinctively felt that if each had operated in precisely the same manner the brilliancy of the results would have been adversely affected.

Preliminary ligation of the inferior vessels, sometimes recommended as a step towards thyroidectomy, is attended by too much disturbance to justify it as a routine. Here again personal factors must be weighed. Some surgeons have perfected their methods of approach and regard ligature of the inferior thyroid artery as a valuable addition to the patient's defence. Finally, may I suggest the retention of the term " Graves's disease " in general discussions on this subject? Knowledge is incomplete until the works of the great Dublin physician are studied and digested.—I am, etc.,

London, W.1, Sept. 24th. W. I. DE C. WHEELER.

SIR,—In the hands of my teachers, Sir James Berry and Dr. Strickland Goodall, the use of ligation in severe cases of toxic goitre impressed me so much that I practise it also. The recent correspondence on this subject (*Journal*, June 30th, p. 1187 ; July 14th, p. 84 ; July 21st, p. 136 ; July 28th, p. 181 ; September 22nd, p. 569), in

which I am greatly interested, prompts me to make the following observations.

It is no argument against ligation to say that it has a mortality. I have known two patients with toxic goitre die when being *x*-rayed, and only the very worst cases come into the tables of cases treated by ligation. In 280 thyroid operations I have lost one patient following a ligation, but I have lost two patients in 100 resections for toxic goitre, and I believe that ligation is the safer procedure when there is any doubt as to the post-operative reaction.

That there is a therapeutic effect following ligation I have not the slightest doubt. I now have a short series of cases whose goitres were highly toxic, very vascular, diffuse, and small, treated by ligation, in stages, of all four arteries. Some were thus treated before we were using preliminary Lugol's iodine solution. The effect of ligation upon these throbbing, purring, and highly vascular glands was very noticeable, and, what is perhaps more important, the relief of the patients which followed. I would refer to just three such cases: those of a plumber, a railway signalman, and a young schoolmistress. Each was a case of highly toxic, very vascular, diffuse goitre, for whom quadruple-stage ligation was performed with such relief that, from being confined to bed for long periods, each patient was able to return to normal employment. These cases have been seen since and have not relapsed, and the thyroids are apparently normal. In the *British Medical Journal* (1926, i, 561) I drew attention to the benefit to be derived from ligation in such cases.

I believe that the inferior is the more effective artery to tie, because it is the artery to the hilum of the gland (cf. renal, etc.), is usually larger than the superior, and, through a small incision behind the sterno-mastoid, its trunk can be secured, well away from, and therefore without interfering with, the gland itself. I recorded these and other observations relating to the thyroid arteries in the *Journal of Anatomy* (1929, lxiv, 50).

While admitting, therefore, that subtotal thyroidectomy is the operation of choice in most cases, I believe that ligation of arteries has a distinct place in the treatment of toxic goitre, and that those surgeons who lack the very extensive clinical and operative experience of Mr. C. A. Joll will do well to apply the maxim: When in doubt ligate.—I am, etc.,

LAMBERT ROGERS.

Surgical Unit, Welsh National School of Medicine, Cardiff, Sept. 24th.

Ether Convulsions

SIR,—The following case serves to strengthen an already strongly held opinion—that gas and oxygen should always replace ether as far as possible, especially in young and septic patients.

On July 28th, 1934, I anaesthetized a male patient, aged about 20, for operation for acute appendicitis. He was of very good physique; it was an emergency case at midnight, so no basal anaesthetic was used: for these two reasons ether was employed. Induction was by ethyl chloride and eau-de-Cologne, followed by closed ether and oxygen. Colour was bright pink throughout. Respiration was somewhat jerky all the time, in spite of nasal and oral tubes, which gave a good airway. Otherwise anaesthesia was without incident until the peritoneum was being sutured. This was after about fifty minutes—the appendix was sloughing, adherent, and difficult to separate, which accounts for the operation taking three times as long as usual.

Twitching movements of the right side of the face were then noticed. The anaesthetic was stopped immediately, as their significance was realized at once owing to experience of a previous case. The twitchings spread over the face, and also affected the body muscles. They continued for five to ten minutes, but never became very severe. Carbon dioxide and oxygen was given, and the table raised into the head-up position. The movements then stopped. (Raising the head is a method of treatment which appears to have been successful in other cases. It is an interesting fact that, as far as I know, only one case of chloroform convulsions has been recorded. This is suggestive, in view of the cerebral anaemia produced by chloroform.)

Intravenous barbiturates have been recommended, but no sedative of this sort was available (it was a nursing home case and 1 o'clock in the morning); so a second dose of morphine was given. Uneventful recovery followed.

This case is very typical: young adult, septic case, summer weather—these three factors are almost invariably present. In the *British Medical Journal* (June 21st, 1930), following a previous (fatal) case of ether convulsions, I collected twelve different theories of causation from the literature, none of which fitted the facts. I tentatively suggested a thirteenth—namely, that the convulsions might be due to impurities in the oxygen. Unfortunately the oxygen used in this case could not be tested, because the cylinder ran out just before the onset of the convulsions.

The points of interest in this case are: (*a*) The convulsions were not severe. Was this due to the stopping of the anaesthetic immediately the first slight facial twitching appeared, or was it just luck? (*b*) They stopped almost immediately the head was raised. Again, was this *post* or *propter*? (*c*) As in my only previous case the patient had died on the table it was a very anxious five minutes. Even when the convulsions stopped there was the possibility that they might start again during the next few hours. This has been known to occur. The morphine was given for this reason, and also a supply of carbon dioxide was left by the bedside. (*d*) Was the jerky respiration, in spite of a good airway, a premonitory sign of the convulsions, or due to the same cause which produced them?—I am, etc.,

Morley, nr. Leeds, Sept. 23rd. W. STANLEY SYKES.

Control of Treatment in Cancer by Serum Tests

SIR,—Dr. Hernaman-Johnson's letter (September 15th, p. 534), with regard to his employment of the modified Bendien reaction as a means of estimating the response to *x*-ray treatment in cancer patients, is an interesting and valuable corroboration of my own findings, to which reference has been made in a recent publication on the "Serological Observations from Cases of Cancer under Treatment."[1] From my experience of this test during the past three years, the reaction of the serum in the large majority of cases is positive in those showing active clinical cancer, the exceptions being found in those associated with sepsis or suffering a marked degree of emaciation, and the reasons for the alteration of the usual reactions under these conditions are explained in the paper referred to above. After removal or destruction of the local cancer, the blood serum reaction in the majority of cases still remains positive. In those in which it subsequently has become and remained negative, and regained a normal reaction, recurrence or metastases have not so far developed. In others, whose serum had regained a negative reaction, clinical recurrence has been preceded by the return of a positive serum reaction, and these alterations can be observed and detected by consistent periodic follow-up serum tests such as Drs. Hernaman-Johnson and Harry Coke are adopting.

It is in the group of cases whose serum reaction has remained persistently positive in spite of clinical post-operative improvement that recurrence and metastases have been found to develop most regularly. There is, however, a further group of cases which have now been

[1] *Journ. State Med.*, xlii, No. 8.

watched for periods of two years or more in which the serum reaction remains consistently positive though the primary tube reaction is more or less in the normal zone, and in these so far there has been no evidence of clinical recurrence.

The observations of Lockhart-Mummery and others have given very strong evidence that the local development of cancer depends upon an intrinsic gene instability of the cells affected, producing those mutations which result in dedifferentiation. If surgical treatment has successfully removed all such cells, it is quite feasible that further local cancer will not recur or develop, although the serum reaction of the patient remains positive, and thereby demonstrates that the normal somatic cytolytic defence is still defective. Such an unsatisfactory condition, however, leaves the patient open to the redevelopment of cancer elsewhere should a further gene mutation occur in another group of cells. During the past two years three such cases have been observed. In each there had been clinical evidence of improvement after the removal of the primary local cancer—breast, stomach, and cervix uteri respectively. In each the blood reaction continued positive, in each a further primary cancer ultimately developed, and in each it happened to be of the colon and sigmoid.

The modified Bendien reaction has been shown in other publications to depend upon certain serum biochemical alterations which are also associated with deficiency of normal enzymic content of the blood serum, and that this is accompanied by a deficiency of that cytolytic defence which presumably under normal conditions destroys, by a process of cytolysis, the abnormal type of cell that results from the particular gene mutation producing dedifferentiation ; and, experimentally, it has been shown that the recovery of a normal and negative reaction has been associated with re-establishment of a normal blood serum enzyme content and evidence of immunity from recurrence of cancer. Any therapeutic treatment which is followed consistently by such a result would appear worth while pursuing, and the results to which Dr. Hernaman-Johnson refers from his particular method of application of *x*-ray treatment are definitely encouraging. Somewhat similar results are being obtained by various forms of injection treatment which are being employed in my own clinics, but they must be observed over a longer period of time before evidence can be gained as to whether both the clinical and the serological improvement are maintained.

The observations emphasize what is, I think, a growing consensus of opinion—namely, that the effective prevention and control of cancer recurrence necessitates that, as soon as the requisite local surgical or radiological treatment has been carried out, every case of cancer should be considered an urgent medical problem, and that the state of constitutional deficiency which precedes the clinical development of cancer and usually continues after its surgical removal should be rectified and maintained normal by whatever therapeutic means shows this to be possible.—I am, etc.,

Liverpool, Sept. 20th. E. CRONIN LOWE.

Treatment of B. coli Infections

SIR,—In Professor D. M. Lyon's excellent review of present views on the aetiology and treatment of *B. coli* infections, in the *British Medical Journal* of September 8th (p. 455), there is a strange omission of any reference to the intravesical method of the treatment of urinary infections with this organism. Far be it from me to suggest that the intravesical route is the most satisfactory for the treatment of such cases ; my personal experience is too limited to make any such claim. But as I showed in a paper published in the *Journal* of June 7th, 1925, the intravesical injection of collargol produced a cure, more or less rapid, in 68 per cent. of the small number of cases I had treated in this way. Moreover, the treatment had yielded successful results in the hands of others, including the late Sir Percy Sargent. Experience as a hospital pathologist has shown me that other lines of treatment, although sometimes surprisingly successful, are by no means always so, and in any case are usually lengthy.

In the circumstances it seems unfortunate that intravesical treatment should receive no mention, and therefore tend to be neglected.—I am, etc.,

London, W.8, Sept. 23rd. HAROLD H. SANGUINETTI.

Rupture of Extensor Pollicis Tendon

SIR,—I have read with interest, in your issue of September 15th (p. 515), the article by Mr. A. T. Andreasen on bilateral rupture of the tendon of the extensor pollicis longus. Although I have not seen a bilateral case, I saw a unilateral one a few months ago which had some similarities to Mr. Andreasen's case. The history in this case is interesting.

The patient, a female, had a slight accident to her right wrist. A short while after this she discovered that she had lost the use of the terminal phalanx of her thumb. On examination there was found to be loss of power in extending the terminal phalanx. It was decided that resuture of the torn tendon was necessary.

At operation the terminal portion of the tendon of the extensor pollicis longus was exposed, but the proximal portion could not be found, in spite of an extensive incision. It was then decided to perform a tendon transplant. The extensor carpi radialis longus was exposed and cut across at its insertion into the base of the second metacarpal bone. The tendon was then sewn to the distal end of the torn extensor pollicis longus. The wound was sutured and the thumb was placed in a moulded plaster-of-Paris splint in the position of extreme extension. The functional result is perfect, and there is no weakness in the movements of the wrist or thumb.

Mr. Andreasen's case is of interest in that he used a slit in the tendon of the extensor of the index finger for anchoring the torn tendon. Should another case present itself to me I should not hesitate to follow his procedure.—I am, etc.,

London, W.1, Sept. 21st. MAURICE LEE.

Alkali Reserve in Asthma

SIR,—Dr. James Adam's letter in the *Journal* of September 15th very pointedly draws attention to the disputed problem of alkalosis or acidosis in asthma. At repeated intervals one reads the statement that asthma presents an alkalosis, but no evidence of any value is ever brought forward to substantiate this claim. On the other hand, Dr. Adam's own work, and that of others in this country and abroad, does more than suggest the acidotic tendency in this disorder. The reference in Dr. Moll's article to the Tiefensee acidifying diet being beneficial in asthma is largely discounted by the later article of Michel Szour (*Med. Press*, December 9th, 1933, p. 98).

It seems to me that the alkalotic theory, having once been put forward, is accepted without question, and repeated *ad nauseam* without evidence. The same intolerance to all other views is shown by those who are allergic enthusiasts, despite the fact that many, like Dr. Adam, do not accept allergy *per se* as the real cause of asthma, but as an added state within a basic condition. None deny the fact of allergy: they only question its importance. It is obvious that the nose condition described by Adam,

Haseltine, and others is quite misunderstood by their critics. It can be made quite clear that nasal operation is the last thing desirable in asthma, and it is only gross abnormalities which demand it.—I am, etc.,

London, W.1, Sept. 18th. A. J. D. CAMERON, M.B., Ch.B.

The Swab in Diphtheria Diagnosis

SIR,—I have followed this correspondence with interest. In my opinion clinical experience will have to count for much in those patients not children, and probably in a high percentage, owing to the early use in illness of antiseptics such as lozenges, gargles, throat sprays, etc. Fortunately that age group is not the "tracheotomy-danger" one if reliance is placed upon a swab from a disinfected part.—I am, etc.,

Bacup, Sept. 23rd. J. PERCIVAL BROWN, M.B.

Tuberculin

SIR,—Dr. Halliday Sutherland's letter in the *Journal* of June 30th (p. 1188) has tempted me to relate a personal experience of mine with tuberculin.

Four years ago I worked in a children's hospital near London. Each child admitted to the section in which I was engaged was submitted to an intradermal tuberculin test, O.T. Koch being used. Three dilutions of tuberculin were supplied from a central laboratory. I have no figures, but over one hundred children were tested, their ages varying from about 3 to 12 years.

0.1 c.cm. of 1 in 10,000 dilution was discarded, being too weak.

0.1 c.cm. of 1 in 1,000 dilution was most reliable and safe, as it never caused any general symptoms or local trouble.

0.1 c.cm. of 1 in 100 dilution was never used as an initial test, or if more than a slight flush without induration was caused by the higher dilution. Children negative to 1 in 1,000 dilution, as a rule, gave only slight or no reaction to 1 in 100 dilution, and no general symptoms or local trouble occurred. 0.1 c.cm. of 1 in 100 dilution I consider dangerous as an initial test, and, perhaps, too searching for any test.

Each week, after applying the test to a number of children, I injected, intradermally, into my own forearm, 0.1 c.cm. of 1 in 1,000 dilution. After each injection a well-marked, tender, inflammatory lump developed which persisted for several days. I once injected 0.1 c.cm. of 1 in 100 dilution intradermally. About eight hours later I felt very ill, with severe rigors and temperature 103° F. Next morning my temperature had returned to normal. I felt weak, but did not remain in bed. In forty-eight hours I had recovered completely. There was severe local reaction with blistering, and lymphangitis extending to the axilla. No mistake was made in the dose, because only the three dilutions mentioned were available, and just previously some quite young children had had similar doses. These children, as mentioned, were negative to higher dilutions.

Three members of my family—brother and sisters—died of tuberculosis, and a fourth is an invalid with the same disease. I have been subject to attacks of bronchitis every winter since I was a child. My health has otherwise been quite good, and I am now over 40. My finger nails are slightly curved, but there is no clubbing. For several years past I have examined my purulent sputum every time I got a cough, but have never found any tubercle bacilli. About two years ago I had my chest examined and *x*-rayed by a leading physician in London. No evidence of pulmonary tuberculosis was found. I had to leave England because of my winter disability.

My single experiment seems to indicate that a severe local and general reaction, following even so small a dose as one thousandth of a cubic centimetre of Koch's old tuberculin, is not proof of active tuberculosis in an adult. It proves also that, to some of us, tuberculin is highly toxic.—I am, etc.,

August 13th. M.B., D.P.H.

Haemorrhage from Peritonsillar Abscess

SIR,—If Mr. Thomas A. Clarke turns to page 257 of Mr. Irwin Moore's authoritative work *The Tonsils and Adenoids and Their Diseases* (Heinemann, 1928) he will find the following passage:

"Cunningham states that . . . (*d*) the descending palatine branch of the internal carotid anastomoses with the ascending palatine and tonsillar branches of the external maxillary, and with the ascending pharyngeal."

The gist of Mr. Denis Browne's communication seems to be that haemorrhage following tonsillectomy is venous rather than arterial in origin. Anybody who has seen small arterial twigs spurting in the tonsillar fossa at operation will find it hard to believe this. Again, one often sees a considerable length of the medium-sized vein referred to lying on the capsule of the tonsil after tonsillectomy with the guillotine, and it is remarkable how very seldom haemorrhage follows.—I am, etc.,

Dublin, Sept. 18th. T. G. WILSON.

Medical Training for Natives in South Africa

SIR,—Our attention has been drawn to a communication from your Pretoria correspondent in connexion with medical and nursing services in the native territories of the Union of South Africa which was published in your issue of July 21st (p. 128). With the proposition that the provision for these services is hopelessly inadequate we are in complete agreement, and we welcome the action of His Majesty's Ministers in the Union of South Africa in deciding to improve the position. Since, however, the remarks of your correspondent may be taken to mean that the medical schools already in existence in this country are unwilling or unable to undertake the work of training natives as doctors, we have thought it desirable to address you on the subject, and to show conclusively that this is not the case.

The position of this university in this matter was set out in Union Government Blue Book 35, 1928, Section 55, which reads:

"55. The resolutions on the subject, which were adopted by the University of the Witwatersrand in October, 1927, are to the following effect:

(*a*) That, if the Government decides that facilities for the training of non-Europeans in medicine should be provided, the Council considers that no separate school should be instituted for the purpose, but that the facilities should be offered by one of the existing medical schools.

(*b*) That this University is prepared to undertake the training under the following conditions:

(i) In view of the strong prejudice of the community, non-European students cannot be admitted to the existing medical classes for European students, but they must be taught in separate classes.

(ii) The same training should be given and the same standard demanded as for European students.

(iii) As the finances of this University cannot support the additional burden entailed by the establishment of classes for non-European medical students, full provision should be made for such additional cost, including the necessary buildings and equipment as well as the recurring expenses."

With these resolutions we are still in complete agreement, except that we should not now lay quite so much stress on segregation. Obviously native medical students could not receive their clinical training in European wards, but some of the pre-clinical work could be done in joint buildings. In so far as clinical material is concerned there is an ample supply in Johannesburg. Our one bottle-neck is obstetrics, and even here, with the admirable facilities provided by the Bridgman Memorial Hospital for Natives, we could obtain amply sufficient

cases for the number of native medical students likely to come forward in Johannesburg.—I am, etc.,

University of the Witwatersrand, Johannesburg, Sept. 4th. H. R. RAIKES, Principal.

⁂ Although the views expressed by the Principal are entitled to respect, it must be pointed out that three of the five members of the Government committee, to whose report he appears to take exception, were themselves members of the Board of the Faculty of Medicine of the Witwatersrand University, and therefore presumably well informed as to the true sentiment of the university. These members were: Sir Edward Thornton, Dr. A. J. Orenstein, and Dr. E. H. Cluver. Further, in spite of public statements as to the willingness of the university to provide higher education for natives (including medical education), no Bantu student has yet been admitted to the university, although there must be numbers of natives desirous of reading medicine, since not a few proceed overseas to British schools to take the course.—ED. *B.M.J.*

"Port Sanitation and Common Sense"

SIR,—Having spent some years as a port medical officer I was much interested in the article by "Ship Surgeon" in the *Journal* of August 25th, and I should like to express my entire agreement with his very common-sense criticisms.

Bills of health, of which the captain usually produces a bundle, all duly stamped for varying amounts, are seldom looked at, and the present system under which ships from so-called "infected ports" are boarded, crews inspected, and addresses taken regardless of the state of health of those on board, and in the absence of any infectious disease, is an anachronism seldom justified by results. It is immaterial where the ship comes from, provided she is free from infectious disease, and I consider that if the captain or doctor can answer the questions on the declaration of health in the negative, the ship should be given free pratique without reference to the port medical officer. If, however, the captain or doctor is for any reason unable to do so, it is nowadays a simple matter to send a wireless message stating the probable time of arrival, and the port medical officer can then make the necessary arrangements to meet her. I am convinced that if a system on these lines was adopted it would effect considerable economy in time and money without loss of efficiency.

In your editorial of September 8th (p. 480) Dr. White, medical officer for the Port of London, is quoted as expressing the hope that the routine boarding of ships from infected ports may be discontinued. In this I wish him every success, though I fear he will meet with opposition from higher authorities. I have been told many amusing stories of the procedure in some foreign ports—amusing, that is, in retrospect, though undoubtedly irritating at the time—but I think "Ship Surgeon" will agree with me that in English ports he is not pestered for details of the bos'n's lumbago, etc., and that ships are cleared with the least possible delay and inconvenience. At any rate, captains have on several occasions expressed their appreciation of the quick clearance they get in home ports, as contrasted with the delay and irritating inquisition to which they are subjected in many foreign ports.—I am, etc.,

September 20th. P.M.O.

SIR,—I appreciate the reply by "Ship Surgeon" to my criticism of his original article on "Port Sanitation and Common Sense." I also realize that his remarks were aimed chiefly against the officials in South American and Mediterranean ports rather than against those in Great Britain.

Let me remind "Ship Surgeon" that the questions about cases of illness, etc., are still put verbally by the quarantine officer of H.M. Customs when granting pratique to vessels arriving from ports within the area bounded by the mouth of the Elbe on the east and Brest on the west, for which area the declaration of health does not require completion. His objection to a recital of cases *completely recovered* from illness occurring early in the voyage may at first sight seem reasonable. But what of the fomites? It is essential for the port medical officer to know what has been done in the way of fumigation and disinfection (if anything has been done at all) to the bedding and the quarters occupied by the patient. In my experience surgeons are apt to be rather vague on this point, and few ships carry the wherewithal to fumigate so important a fomite as, say, the mattress on which the patient lay.

The general practitioner ashore is in precisely the same position as the ship surgeon with regard to "missing" a case of typhoid fever, etc., but experience teaches port medical officers to have typhoid in particular uppermost in mind, as it is the most frequent disease labelled "influenza" or "P.U.O.," especially in the first stages or when of the ambulatory type. I take it "influenza" is one of "Ship Surgeon's" "minor maladies" in the ordinary way. Ninety-nine times out of a hundred "minor ailments" may be mares' nests, but it so happens that the port medical officer has to be constantly on the *qui vive* for the hundredth occasion.

No port medical officer would claim omniscience for an instant, but with great diffidence I would point out that a D.P.H. and/or a D.T.M. and H. are essential qualifications for a port medical officer, in England at least, whereas a ship surgeon requires at present no special qualifications. Until the ship surgeon is legally made the medical officer of health of the vessel he serves in, I feel that the Utopia we all hope for, when much of the routine can be abolished, is still far distant, and the law (ass that it may be) will have to be maintained. I fully appreciate that "Ship Surgeon" was not addressing his remarks at British port sanitary authorities, and I would again like to express the great pleasure it gave me to read his article, a pleasure which I am sure was enjoyed by many others.—I am, etc.,

September 23rd. A PORT MEDICAL OFFICER.

The Services

Lieut.-Colonel Nanalal Maganlal Mehta, Indian Medical Service, died at Trichinopoly on July 19th, aged 46. He was born on December 31st, 1887, and was educated at the Grant Medical College, Bombay, where he took the L.M.S. in 1910, and at the Middlesex Hospital, taking the M.R.C.S., L.R.C.P. in 1911. Entering the I.M.S. as lieutenant on July 26th, 1913, he became lieutenant-colonel after twenty years' service. He served in the war of 1914–18—in German East Africa in 1914–16 and in the Egyptian Expeditionary Force in 1916–18. After the war he entered civil employ in the Madras Presidency, where he had been civil surgeon, successively, of South Kanara, Coonoor, and Trichinopoly.

Lieut.-Colonel Albert Anderson Meaden, D.S.O., R.A.M.C. (ret.), died after a year's illness at Dymchurch, Kent, on August 31st, aged 58. He was born on June 15th, 1876, the son of the late Rev. R. A. Meaden, was educated at Highgate School and at Bart's, where he gained the Lawrence gold medal and scholarship in 1903, and took the M.R.C.S., L.R.C.P.Lond. in 1902. Entering the R.A.M.C. as lieutenant on January 30th, 1904, he became lieutenant-colonel on October 4th, 1926, and retired on June 15th, 1931. He served in the war of 1914–18, was mentioned in dispatches in the *London Gazette* of February 7th, 1915, and January 1st, 1916, received the D.S.O. in 1916, and served in Afghanistan in 1919, again being mentioned in dispatches. He leaves a widow and one daughter.

Obituary

W. H. TRETHOWAN, F.R.C.S.

Orthopaedic Surgeon to Guy's Hospital

The death of Mr. William Henry Trethowan, at a comparatively early age, came as a great shock to all his friends. He had been unwell with acute tonsillitis, but had made a good recovery, and it was hoped that on the return from his holiday he would come back full of vitality. He unfortunately appears to have developed an acute septicaemia, from which he died on September 12th after a short illness in Stockholm.

He was an exceptionally gifted man. From the outset his career was brilliant: he worked his way up with a series of scholarships and entered Guy's Hospital in 1901.

In 1906 he was awarded the gold medal in the M.B., B.S.Lond., and subsequently held all the junior house appointments at Guy's. In 1912, after obtaining the F.R.C.S., he was appointed the first orthopaedic surgeon to that hospital. During the war he was chosen by Sir Robert Jones as one of the surgeons to help him in the great work at the Military Orthopaedic Hospital, Ducane Road, Shepherd's Bush. After the war he was elected surgeon to the Royal National Orthopaedic Hospital and consulting orthopaedic surgeon to Queen Mary's Hospital for Children, Carshalton.

To those who knew him any obituary notice must sound cold and inadequate, for he was a most remarkable man. He was said by his contemporaries not to have shown in his early days any special surgical aptitude, but the fact remains that, whether it was an inherited or an acquired gift, he succeeded in making himself the most masterly technician of his day. He developed certain methods of his own. He always operated under a tourniquet, and was well known for the length of his incisions—in fact, it was always easy to recognize a case that had been operated on by him. Some used to think that his incisions were unnecessarily long; but when one saw him at work, and saw how the parts seemed to fall away under his magical fingers, and how a difficult operation when performed by him appeared so easy, one realized that though the incision may have been long it greatly simplified the operation. Onlookers were often amazed to see him sew up the wound without ligaturing any vessels, and when questioned upon this he always used to say that if you get down to the bone at its most superficial part and stay there you cannot cut anything of importance. His facility with the knife led him to do operations which other people might hesitate to undertake, and there is scarcely any orthopaedic condition for which he has not at one time or another attempted some bold procedure. His boldness was such that it left his audience flabbergasted, but he seemed to have an uncanny gift of knowing exactly how far he could go with safety. This operative skill in the hands of a lesser man would have been a most dangerous one, but Mr. Trethowan was a very strong critic of himself and was the first to admit if any method he advocated did not come up to his expectations.

He had a very great sense of responsibility—responsibility to his hospitals, to his patients, to his students, to his subordinates. He was continually worrying whether he was teaching his dressers sufficiently and whether full use was being made of the beds he had at his disposal. The trouble he was always up against was how he could reconcile this sense of responsibility to his hospital work with the clamourings of a colossal practice. The tragedy is that he succeeded, and those who were in close touch with him realized he was doing far too much.

Mr. Trethowan could never think in a groove. Any subject he gave his attention to he always illuminated; consequently, though unorthodox, he was a most inspiring teacher. His out-patient clinics were always well attended, not only by Guy's students but by men from all parts of the world. There was never one moment's dullness while listening to him. He could always extract some interest out of an apparently dull case, and enliven the proceedings by outbursts of an irrepressible sense of humour. We have already mentioned in how many directions he was torn by his sense of responsibilities and how, at the expense of his health, he succeeded in reconciling it, but there was one duty he overlooked, and that was his duty to posterity. It will always remain a matter of deep regret to his friends and colleagues that the call upon his time was so great that he was not able to put in writing the thoughts that passed through his brilliant brain. He was such a great artist in everything he did that had he elected to write a textbook on orthopaedic surgery there is no doubt that it would have been a memorable volume.

C. L.

E. M. L. writes:

The untimely death of William Henry Trethowan must be deplored by all those who worked with or under him. When, during the world war, the appalling mortality of gunshot wounds of the limbs was realized by the Government, and Sir Robert Jones (then Major-General Jones) was entrusted with the formation and direction among others of the Military Orthopaedic Hospital at Shepherd's Bush, he very wisely decided to form a staff of young surgeons who might be expected to be receptive of new ideas and not have much to unlearn. Among those selected was W. H. Trethowan, who joined the staff as a captain R.A.M.C.(T.) and served on it till some time after the cessation of hostilities, when the hospital was continued under other designations. The lessons which he learnt at Shepherd's Bush Trethowan put into practice at Guy's and at the other scenes of his activity. Trethowan was an outspoken critic of others' work: his own work in the operating theatre was bold but sound. His was always an independent mind, and it was never his habit "jurare in verba magistri" without critical inquiry. Nevertheless the teaching of Robert Jones affected him strongly, and he contributed the article on "The Treatment of Simple Fractures" to Jones's *Text-Book of Military Orthopaedic Surgery* in 1920. He also contributed the article on orthopaedic surgery to Choyce's *System of Surgery*. He was a skilled musician, and among his instruments were the organ and the pianoforte.

JOHN A. MILROY, M.A., M.D.

Professor of Biochemistry, Queen's University, Belfast

We regret to record the death, on September 19th, of Professor John A. Milroy, who came to Belfast as lecturer in physiology in 1902. After a distinguished undergraduate career at Edinburgh he graduated M.B., C.M. in 1896, having obtained the degree of M.A. in 1893. He filled the posts of demonstrator in physiology in Leeds and at Owens College, Manchester, and proceeded to the degree of M.D. in 1902. Part of his post-graduate studies had been undertaken on the Continent, and he gained valuable experience in laboratories in Germany, where his enthusiasm was stimulated and his knowledge extended by studies carried out in that country.

Professor Milroy never lost interest in the work of universities all over the world, and he was familiar with

physiological progress in Germany, Austria, and the Netherlands, whose languages he read in the original text. His wide knowledge of the literature was in frequent demand by his co-workers. In this connexion it is pleasant to record his agreeable personality and ease of approach: no one in search of help ever found a man more willing to assist without leaving any sense of inferiority or animosity, but rather arousing a sense of admiration. "Doctor John," as he was familiarly known, never obtruded his own views solely to stimulate a conflict in a discussion, nor did he ever appear other than kindly, if somewhat shy; nevertheless, he expounded his views with a quiet assurance that was more than helpful. Milroy made many valuable scientific contributions to various journals, with which his colleagues in biochemistry and physiology are familiar. He was one of the contributors to the *Encyclopaedia of Medicine*, but is best known to medical students for his book, *Practical Physiological Chemistry*, of which his brother, Professor T. H. Milroy (who holds the Dunville chair of physiology at Queen's University, Belfast), was part author.

Having filled the post of lecturer in physiology at Queen's University for seven years from 1902 Dr. Milroy, as he then was, succeeded to the lectureship in biochemistry, and subsequently, in 1922, was appointed reader in the same subject. The munificent donation of the late Mr. J. C. White to the university was partly devoted to laboratories and to the establishment of the chair in biochemistry, of which Professor Milroy was the first occupant, and which he held at his death. In this position he more than fulfilled the early promise of his undergraduate days, and his loss leaves a vacancy which will be difficult to fill.

During his thirty-two years' connexion with Belfast Professor Milroy endeared himself to his colleagues and successive generations of students. He was unmarried, and resided with his brothers and sisters, with whom deep sympathy is felt in the medical and academic world of Belfast.

CYRIL CHARLES WILLIAM MAGUIRE, M.D., M.R.C.P.

Physician to Out-patients at Queen's Hospital, Birmingham

Dr. Cyril Maguire died at his residence in Harborne Road, Edgbaston, on September 15th, at the age of 37. He returned from his holidays in Scotland at the end of August, and soon afterwards developed a cold, which led to severe complications, and he died of septicaemia after an illness of about twelve days.

He was the only son of Mr. Bernard Maguire of Stirling Road, Edgbaston, and was educated at St. Philip's Grammar School, and at Birmingham University, which he entered as a medical student in 1916 at the age of 19. He had scarcely embarked on his medical career when he volunteered for military service, and joined the Royal Warwickshire Regiment at the end of 1916. In the war he served with distinction, and was awarded the Italian Military Cross for a special act of bravery, and was twice mentioned in dispatches by the Earl of Cavan. He resumed his medical studies in 1919, and after a distinguished career as a student took his medical degree in 1923.

In preparation for the career before him he held a succession of posts in Queen's Hospital, Birmingham, being in turn house-surgeon, house-physician, medical registrar, and pathologist. In 1926 he obtained the post of physician for out-patients at Queen's Hospital, and after a course of study in Paris and Vienna took up his duties at the hospital. He quickly added to his reputation, and was soon a very popular young physician, held in high esteem by his colleagues and beloved by his patients. The students appreciated his teaching, and attended both his out-patient clinic and his lectures in large numbers. At the same time he developed a big private practice, and was highly thought of by a wide circle of medical practitioners, who relied on his help in their most difficult cases. Dr. Maguire was joint honorary secretary of the Birmingham Branch of the British Medical Association in 1927–30. He leaves a widow and two children.

An old school friend writes: Cyril Maguire was a man of striking personality. He was always so. Even when a schoolboy he stood forth from his fellows. He worked hard and he played hard. He had a spice of joyous mischief, a heritage from his Irish forebears, which endeared him to everyone. On the football field his vigour was more striking than his orthodoxy, but his coltish figure already gave promise of the impressive physique which so dignified his manhood. At an age when normally he should have been pursuing his medical studies he became a subaltern in the Royal Warwickshire Regiment. He served in France, and later on the Austro-Italian front. He was twice mentioned in dispatches, and earned the Italian Military Cross by a deed of gallantry typical of the man. Two days before the battle of the Piave River he volunteered to enter the Austrian front line trenches to take a prisoner for the purposes of interrogation. With three others he succeeded in his mission, running the gauntlet of fire from the enemy and our own troops. On demobilization he returned to us, not as the homing warrior, but as a man who, having done one job, was eager for the next. As a medical student he displayed the same energy and thoroughness, passing his professional examinations in his stride. As a humorous writer he became a stalwart of the *Queen's Medical Magazine*. He was a man who won and kept the friendship of the many who now mourn his loss. A devout Catholic, his faith was reflected in his daily life. We who loved him knew that no success would spoil him, and his young life was rich with promise.

We regret to announce the death of Dr. JOHN HOLLINGWORTH at the home of his son in Cottingham, Yorkshire. When he retired from active work, on grounds of health, after practising in East Hull for more than fifty-five years, Dr. Hollingworth was the oldest medical man in that city, where his father had practised for many years before him. He was born in 1853, and studied for his profession at the Leeds School of Medicine, obtaining the M.R.C.S.Eng. diploma in 1877. During his earlier years of practice he took an active part in politics, serving as chairman of local Conservative organizations and helping to found the Primrose League in Hull. In later life he was prominently associated with the work of local scientific, photographic, and other learned societies, and his services as lecturer were much in demand. At the time of his retirement last November Dr. Hollingworth had been a member of the local Division of the British Medical Association for fifty-six years. A kindly, competent, well-informed North Country doctor of the old school, with a strong sense of public duty, his memory will long be held in affection by a wide circle of friends and former patients.

The death occurred in Edinburgh on September 20th, of Dr. JOHN YOUNG, who had practised for half a century at Earlston, Berwickshire. He was born in 1858 at Lilliesleaf, Roxburghshire, where his father was minister of the United Presbyterian Church. After a medical course at Glasgow University, Dr. Young graduated M.B., C.M. there in 1883. He spent a period as resident house-

surgeon in the Glasgow Eye Infirmary, and then as house-surgeon in Scarborough Hospital ; in the latter town he also engaged for a time in general practice. He then settled at Earlston, and became one of the best-known practitioners of the Border region. During the coming autumn he was to have received a public testimonial in recognition of the great affection and esteem in which he was held by his patients, and of his fifty years in practice. Unfortunately, he became ill while on holiday, and died after only a few days' illness. Dr. Young was a keen supporter of the British Medical Association, which he joined in 1887, and at one time was chairman of the South-Eastern Counties Division. He was a devotee of motoring in the early days of this form of transport, and was one of the first doctors in Scotland to use a motor car. He is survived by a widow and two married daughters.

Dr. MARION BALFOUR MARSHALL ROCKWELL, for over thirty years a prominent physician at Amherst, Mass., U.S.A., died there on August 15th. She was born in Scotland on April 24th, 1873, the daughter of Thomas R. Marshall. Educated at Edinburgh and in Germany, she travelled in France and Switzerland before starting her medical studies at the school of the Royal Colleges of Physicians and Surgeons, Edinburgh. Two years later the University of Edinburgh was opened to women students, and Marion Marshall studied there, graduating M.B., C.M. in 1899. She then took a post-graduate course in bacteriology and in ear, nose, and throat diseases, and worked at the Royal Infirmary under Dr. Norman Walker (now Sir Norman Walker). In 1901 she went to America and married Dr. Herbert G. Rockwell, whom she had met at Edinburgh while he was taking a post-graduate course there. In 1902 Dr. Marion Rockwell passed the Massachusetts State Board medical examinations, and shortly after this they moved to Amherst. Dr. Herbert Rockwell enlisted in the medical service during the war, and Dr. Marion cared for her own and her husband's practice while he was on service. He died in 1927. She was a practitioner of unusual sympathy, and was noted for the great amount of charitable work she did. She was a widely travelled woman and an interesting speaker. Throughout the years music provided a delightful refreshment from her strenuous life as a physician. But she loved her medical work, and many of her patients were her personal friends. Though she had travelled extensively in Europe, the East, America, and Canada, she loved to revisit Edinburgh, the home of her childhood. She was a sister of the late Dr. George Balfour Marshall of Glasgow. Dr. Marion Rockwell is mourned by a large circle of friends, both in this country and in America. She was for twenty years a member of the British Medical Association.

The following well-known foreign medical men have recently died: Professor OSKAR WELTMANN, head of the medical department of the Kaiser Franz Joseph Hospital, Vienna, aged 49 ; Professor TOM RINGEL, director of the First Surgical Department of St. George's Hospital, Hamburg, aged 65 ; Dr. CONSTANTIN KAUFMANN, founder of the Swiss society of industrial diseases and accidents ; Professor KOBAYASHI, director of the lepers' hospital at Oshima, Japan ; Professor PIO PEDICONI, a prominent syphilologist of Rome, aged 55 ; Professor LUIGI SIMONETTA of Milan, a prominent hygienist and Senator of Italy, aged 77 ; Geh. Med. Rat Dr. PAUL KRAUSE, professor of internal medicine and director of the medical clinic at Münster, aged 62 ; Professor M. HAMELINCK, a Ghent psychiatrist, aged 51 ; Dr. VALDEMAR MEISEN, a Danish surgeon and medical historian, aged 56, of coronary thrombosis ; and Surgeon General Inspector EMILE CALMETTE, who took part in the Tunisian Expedition of 1881, and during the war was Director of the Medical Service of the 19th Army Corps, aged 83.

Medical News

The opening address of the new session at University College Hospital will be given by Sir John Rose Bradford in the library of the Medical School on Monday, October 1st, at 3.15 p.m. The annual dinner will be held on Friday, October 12th, at 7.30 p.m., with Sir John Parsons in the chair.

The new session at Guy's Hospital Medical School will open on Wednesday, October 3rd, at 2.45 p.m., when Lord Nuffield will distribute the prizes and Mr. C. H. Fagge will give the inaugural address.

The opening of the ninety-third session of the School of the Pharmaceutical Society of Great Britain and the presentation of the Hanbury medal, diplomas, and prizes will take place on Wednesday, October 3rd, at 17, Bloomsbury Square, W.C. The inaugural sessional address will be given by Dr. George Barger, F.R.S., professor of chemistry in relation to medicine in the University of Edinburgh.

The 1934–5 session of the West London Medico-Chirurgical Society opens on Friday, October 5th, at 8.30 p.m., when Mr. Howard M. Stratford will deliver his presidential address at West London Hospital, entitled "A General Practitioner Surveys Psychology." On December 7th papers will be read by Mr. Johnston Abraham on "The History of Syphilis," and by Mr. James Kemble on "The Medical Life of Lord Byron." On January 11th, 1935, Mr. Hugh Cairns will read a paper on "Recent Advances in Intracranial Surgery," and on February 1st Mr. V. B. Green-Armytage will open a discussion on an obstetric subject. A discussion on "Jaundice" will be opened by Dr. J. W. McNee on April 5th.

The annual dinner of the West Sussex Clinical Society will be held at the Dolphin Hotel, Chichester, on Wednesday, October 3rd, at 7.30 p.m. Tickets 8s. 6d. each. Ladies and non-medical guests are invited. After dinner Dr. Habberton Lulham will deliver a lecture on "Human Nature through a Doctor's Eyes."

The final programme has now been issued for the opening of the new session at the Faculty of Medicine of the University of Birmingham. Besides the usual address and the annual dinner of the school, a series of post-graduate lectures will be given at the affiliated hospitals. On October 4th there will be lectures at the Queen's Hospital in the morning and afternoon ; and at 5 p.m. Dr. F. Brett Young will distribute the prizes to students and give an address. At 7.45 p.m. a reception by the dean at the Grand Hotel will be followed by dinner in the Grosvenor Room. On October 5th there will be lectures in the morning at the General Hospital, and in the afternoon at the Children's Hospital, Ladywood Road.

Professor Charles Singer will deliver his presidential address before the London Jewish Hospital Medical Society at the London Jewish Hospital, Stepney Green, E., on "Jewish Influence on Western Europe in the Early Middle Ages," on Thursday, October 4th, at 3.30 p.m.

A series of lectures on "The Prevention of Disease," delivered under the joint auspices of the Royal Institute of Public Health and the Institute of Hygiene at 28, Portland Place, W., opened on September 26th, and will be continued on Wednesdays at 3.30 p.m. to December 12th inclusive.

The old students' post-graduate course at the London Hospital Medical College will be held from Wednesday to Saturday, October 17th to 20th inclusive. The Schorstein Memorial Lecture will be delivered by Sir Farquhar Buzzard, Regius Professor of Medicine in the University of Oxford, in the Medical College on October 18th at 4.30 p.m., and the old students' dinner will be held on that day at 7.30 p.m. in the Trocadero Restaurant, when Dr. J. H. Thomas, a former student, will preside.

The British Institute of Philosophy (University Hall, 14, Gordon Square, W.C.) has arranged a course of four lectures on the importance of a philosophy of life for mental health, for the medical profession, on Thursdays at 5 p.m. from November 1st to 22nd. The first lecture, on "The Biology of Social Life," will be delivered by Professor W. Langdon Brown; the second by Dr. William Brown on "Health, Self-determination, and Free Will"; the third, on "Creative Activity and Mental Health," by Dr. Emanuel Miller; and the fourth by Dr. H. Crichton-Miller on "Belief and Adaptation." Applications to attend the course, the fee for which is 12s. 6d., should be made to the director of studies at the Institute.

A course in tropical medicine and hygiene will be held at the Hamburg Institute for Naval and Tropical Diseases from October 8th to December 8th. Further information can be obtained from the Institut für Schiffs- und Tropenkrankheiten, Bernard Nocht Strasse 74, Hamburg.

A course in cardiovascular diseases will be held at the Hôpital Broussais, Paris, from October 8th to 20th, under the direction of Dr. C. Laubry. The fee is 150 francs. Further information can be obtained from Dr. Lemant, Hôpital Broussais, Paris 14e.

Professor Portmann of Bordeaux will give a course in oto-rhino-laryngological surgery in Paris from October 17th to 24th.

The Fellowship of Medicine (1, Wimpole Street, W.) announces that lecture-demonstrations will be given at 11, Chandos Street, W., at 2.30 p.m. on October 2nd and 9th. Courses of instruction include a week-end course on diseases of the heart and lungs at the Royal Chest Hospital, occupying the whole of October 13th and 14th; medicine and surgery, at the Metropolitan General Hospital from October 8th to 20th, 10.30 a.m. to 6.30 p.m.; cardiology, at the National Hospital for Diseases of the Heart, October 8th to 20th, occupying the whole of each day; ophthalmology, at the Royal Westminster Ophthalmic Hospital from October 15th to November 3rd, every afternoon; clinical surgery, at the Royal Albert Dock Hospital, October 20th and 21st; gynaecology, at the Chelsea Hospital for Women from October 22nd to November 3rd. These courses are open only to members and associates of the Fellowship.

The twenty-second annual meeting of the National Association of Insurance Committees will be held at Scarborough on October 4th, 5th, and 6th.

The Anglo-American Continental Medical Society will hold a meeting in Paris at Dr. Jarvis's (81, Boulevard Malesherbes) on Saturday, October 6th, at 5 p.m. Medical men who are eligible for membership—that is, those who possess British or American qualifications and are licensed in Europe or contiguous territory—are invited to attend. At an informal dinner afterwards a number of London and Paris guests will be present. We are asked to correct a slip in the report in our *Supplement* of August 18th of the society's luncheon party at Bournemouth during the Annual Meeting of the British Medical Association. The honorary secretary is not Dr. Tom Williams (Bordighera), who was deputed to make the arrangements on that occasion, but Dr. H. J. Spon (6, Via Cavour, Ospedaletti, Ligure, Italy).

Features of special interest in the annual exhibition of the Royal Photographic Society, Russell Square, which closes on October 6th, include a photograph of the third quarter of the moon enlarged to 7 feet by 4 feet; aerial views; photographs taken during operations on the brain; and the application of Grenz rays for radiography of small biological specimens. Considerable advances have been made during the last twelve months in the production of sensitive materials suitable for use with cathode-ray and other high-speed oscillographs. The cathode-ray cardiograph for recording heart beats, and various *x*-ray cinematograph films are demonstrated on Monday, Wednesday, Thursday, and Saturday evenings, and on Saturday afternoons.

The second international Congress of the History of Science will be held at Madrid under the presidency of E. Garcia del Real from October 7th to 14th. Further information can be obtained from the general secretary, Professor Francesca Vera, Calle de Caracas 8, Madrid.

The annual prize distribution and conversazione of the Royal Dental Hospital of London, School of Dental Surgery (University of London), will take place at the hospital in Leicester Square, W.C., on Friday, October 5th, at 8 p.m., when Professor William Wright will preside.

A congress of the Association for Photographic and Cinematographic Documentation in Science will be held at the State Paedagogic Museum, Rue d'Ulm, Paris, from October 8th to 12th. Further information can be obtained from Dr. Claoué, 39, Rue Scheffer, Paris, 16e.

A severe epidemic of poliomyelitis has recently broken out in Denmark.

Professor Bruno Oskar Pribram, director of St. Hildegard's Hospital of Berlin, has been made a corresponding member of the Société Nationale de Chirurgie of Paris; Dr. Ludwig Robert Müller, professor of internal medicine at Erlangen, honorary member of the Neurological Society of Tokyo; and Dr. Ludwig Frankel, professor of obstetrics and gynaecology at Breslau, honorary member of the Italian and Brazilian Societies of Gynaecology and Obstetrics.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

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QUERIES AND ANSWERS

Chronic Bone Sinus

"A. B. C." invites suggestions for the treatment of chronic bone sinus, three to four inches in depth, the result of acute osteomyelitis many years ago. Non-healing is due to a narrow neck, and the cavity being in bone now much sclerosed. Is frequent irrigation after curettage best, or can the vaseline pack be employed? If irrigation, what solution, what strength, and how often? The correct treatment of "saucerization" in this case is impracticable. The disease is one of many years' standing and the patient elderly. Are internal medications, such as pot. iodide, manganese, etc., of any help?

Amidol Poisoning

"M. B." (Aden) wishes to know if there is any chemical inactivating or detoxicating agent other than rubber gloves to prevent amidol poisoning through the skin.

After-effects of Continued Doses of Adrenaline

"X. Y. Z." (London) writes in reply to "L. H." (*Journal*, September 15th, p. 538): Some years ago it was my privilege to see a patient—a chronic asthmatic—who to my knowledge had more than 50,000 injections of adrenaline over a period of twenty-five years in order to relieve his asthma. He was an expert chemist, and always made his own solutions, administering the injections himself. On occasion he had as many as ten doses a day. I never found his blood pressure more than 120 systolic, and his death a few years ago at the age of 74 was due to hypostatic pneumonia. Some other points may interest your correspondent. First, that adrenaline should always be given early in the attack, and that small doses are generally enough—I have seldom found more than 5 minims at one time necessary, while Dr. Hurst states that 3 minims is enough. Secondly, the dose may be repeated if need be. Finally, it would appear to be undesirable to administer adrenaline to an inflamed area.

Senile Pruritus

"EX-SUFFERER" writes from South Africa in reply to the inquiry by "Vrach" (July 28th, p. 192): I recommend the following prescription:

℞
Hydrarg. ammon. chlor. ... ... 0.06 gram
Nivem hazelini (B. W. and Co.) ... ad. 64.00 grams
Sig.
An amount the size of a split pea to be rubbed on the affected part until dry.

No scratching allowed. Relief comes within a few minutes.

Income Tax

Employment of Assistant

"A. B. T." inquires what effect, if any, would result (*a*) for the coming assessment, and (*b*) for the return to be made next April, from the employment of an assistant as from October 1st next.

*** (*a*) No result—the assessment for 1934–5 being based on the profits of the previous year. (*b*) The cost of the assistant would be deductible as an expense from October 1st, and the return for 1935–6 would be affected accordingly—for example, by the deduction for three months if the accounts are made up to December 31st, and by six months if they are made up to March 31st.

New Practice—Cash Basis

"R. E." acquired his deceased partner's share, and thereafter the practice has been treated as a "new" one. Returns have throughout been on the "cash receipt" basis, but the inspector of taxes now claims that either the sums payable to the deceased partner's estate be brought into the calculation or the gross income be reckoned on the basis of bookings.

*** The inspector's attitude is correct, because if "R. E." bases his return on the cash received by him the gross income for the first year or so will be shown at less than the true gross *earnings*. Probably the best course to follow will be to make the return on the basis of adjusted cash receipts—that is, the amount received plus the increase in the *value* of the book debts over the period.

LETTERS, NOTES, ETC.

Earwig in Ear

Dr. A. M. VALERIE BONHOTE (Tadworth) writes: At 1 a.m. I was rung up to attend a patient with acute earache. As this was an ante-natal case six weeks from her confinement I was rather anxious. On arrival I found her smiling and apologetic, saying that there was now very little pain. About half an hour before she had woken with a sensation of fluttering in her ear, and told her husband she thought she had a moth in it. She rubbed it, and then had one moment of acute pain, sufficient to make her cry out and wake her neighbours. Since then there had been two attacks of momentary, but less severe, pain; apart from that, there was merely a little discomfort. I found the meatus full of wax, and the drum could not be seen; there was a little blood on the posterior meatal wall, which was disquieting. The other ear was normal in appearance. There had been no history of naso-pharyngeal catarrh, and the patient had gone to bed three hours previously feeling perfectly well. The temperature and pulse were both normal. I decided that it would be safe to leave the patient for a few hours, after inserting some glycerin and carbolic acid drops. I saw her first thing in the morning, and she seemed well, and had had quite a good night. I very cautiously syringed the ear, and to my relief an earwig emerged, together with the wax. The appearance of the drum was interesting: the handle of the malleus was injected, and at one point there was a small scab where the vessel had been punctured. This explained the momentary acute pain and the bleeding—the work of the earwig. I imagine the glycerin and carbolic acid killed the earwig.

Pipe Cleaners in Gynaecology

Dr. D. V. LATHAM (Mwanza, Tanganyika Territory) writes: Some years ago I conceived the idea of using ordinary pipe-cleaners, doubled up and held in forceps, where previously I had used Playfair's probes. I find the pipe-cleaners very useful, because the wire can be bent to any desired shape, they can be sterilized by boiling, and because, as they are not made by a surgical instrument manufacturer, they can be purchased from any tobacconist at twelve a penny. I am tempted to bring this device to your readers' notice because, on a recent visit to some of the more important teaching centres in the British Isles, I was surprised to find that the clumsy Playfair's probe still held sway.

Diagnosis of Glanders

In an *Epitome* abstract of this subject (No. 95, August 4th, 1934) reference was made to the Strauss test, and it was implied that in this test female guinea-pigs are used as experimental animals. The test actually consists of the intraperitoneal injection of suspected material into a *male* guinea-pig. This is followed, if the test is positive, by a purulent inflammation of the tunica vaginalis.

Diet Cards at Harrogate

A series of simple diet charts, adaptable to most types of diseases met with at the spa, have recently been drawn up by the Medical Society of Harrogate. They comprise the following varieties: low calorie, restricted carbohydrate-high-vitamin, restricted protein, lactovegetarian, and low fat. Printed on cards and used in duplicate, one of them is given to the hotel and the other retained by the patient. A particular point is the simplicity of the diets, which aims at bringing the scheme within the compass of the smaller hotels and boarding houses. The Harrogate Corporation, which provides us with this information, thus intends to remove the reproach levelled against Harrogate that sufficient attention is not paid to the important matter of diet in connexion with the "cure."

Vitamin D Concentrate

Glaxo Laboratories (56, Osnaburgh Street, N.W.1) have produced an illustrated pamphlet, "A Decade of Vitamin D," to commemorate the introduction in August, 1924, of ostelin liquid. Ten years ago ostelin liquid was prepared by extracting the vitamin D fraction from fish-liver oils; later its vitamin D content was derived from crude irradiated ergosterol; since 1932 this vitamin has been in the form of chemically pure calciferol, and its standardization can thus be effected to a degree of precision that was previously unattainable. Copies of the booklet are available to medical practitioners at their request.

Orthopaedic Treatment of Infantile Paralysis

In Dr. Charles Mackay's letter on page 534 of our issue of September 15th, nine lines from the bottom, the word "possible," through an unfortunate printer's error, appeared instead of "impossible." The sentence should have ended, "... this ideal treatment advocated is not *impossible* of achievement."

Watson and Sons, Ltd., Sunic House, 43, Parker Street, Kingsway, W.C.2, have issued a pamphlet entitled *Short-Wave Therapy*. A good deal of this is devoted to their "novotherm" valve-operated apparatus, while there are also added indications for treatment and a short bibliography.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 47, 48, 49, 50, 51, 54, and 55 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 52 and 53.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement at page 180*.